THE MARINE REVIEW

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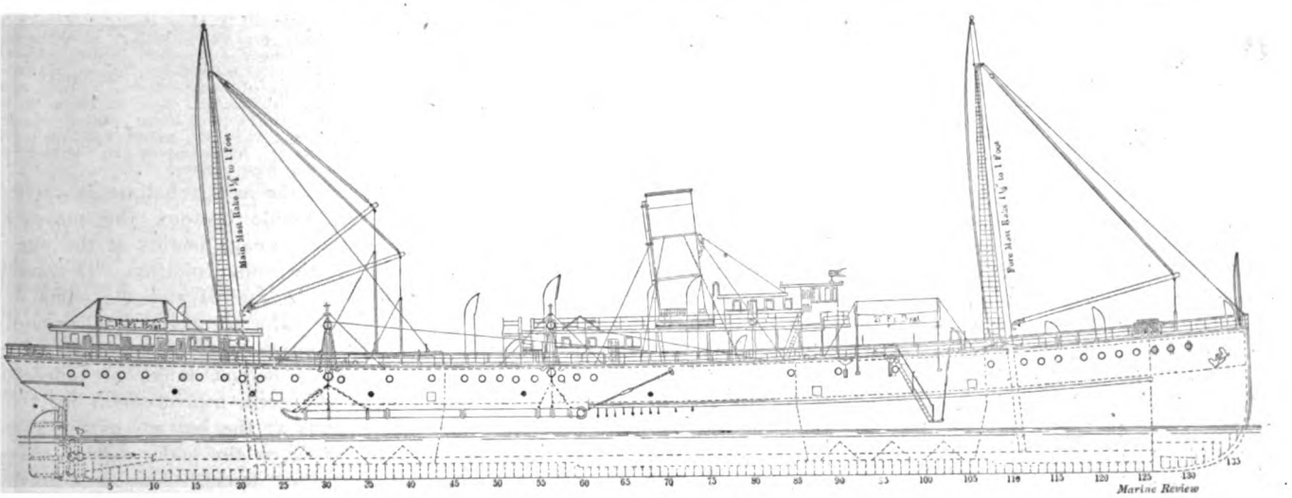
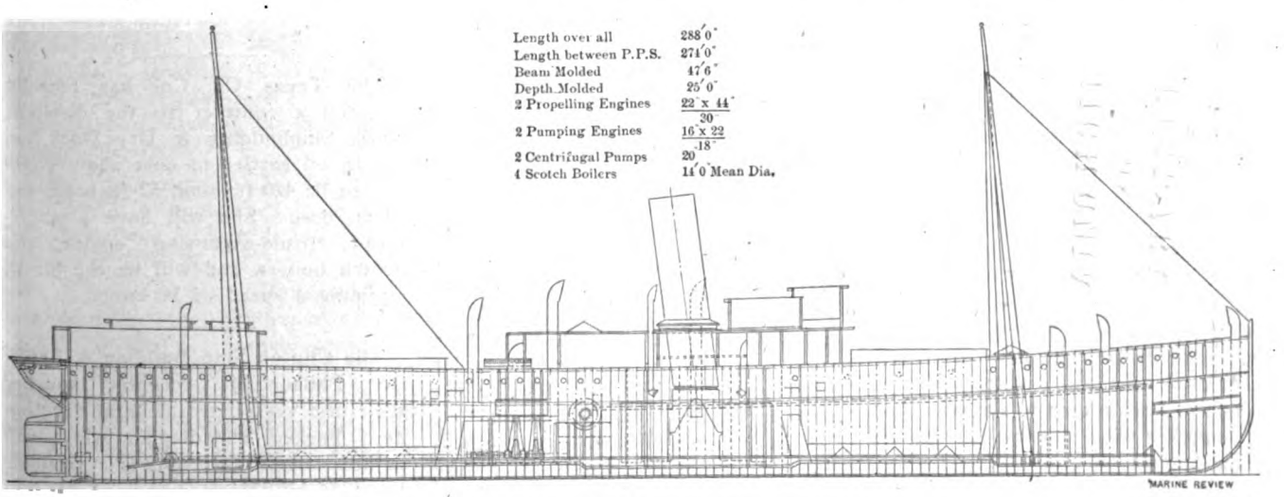


RIGGING PLAN OF THE DREDGER ANCON.

SEA-GOING DREDGE ANCON.

The Maryland Steel Co. launched recently from their yard at Sparrow's Point, Md., the sea-going suction dredge Ancon. This vessel, designed by Capt. E. O. Patterson, is similar in construction to the dredges previously built for New York harbor work, and is of the following dimensions: Length betwen perpendiculars, 274 ft. 0 in.; length over all, 288 ft. 0 in.; beam, molded, 47 ft. 6 in.; depth, molded, 25 ft. 0 in.

The propelling machinery consists of two sets of compound engines, with cylinders of 22 and 44 in. diameter, and a stroke of 30 in. The condensers, which are independent, have a cooling surface of 4,011 sq. ft. The high-pressure cylinders are provided with piston valves, ordinary slide valves being fitted to the low-pressure cylinders. The propellers are of cast iron, 9 ft. 6 in. diameter and 12 ft. pitch. Four


Length over all 288′0″
Length between P.P.S. 271′0″
Beam Molded 47′6″
Depth Molded 25′0″
2 Propelling Engines 22″ x 44″ / 30″
2 Pumping Engines 16″ x 22″ / 18″
2 Centrifugal Pumps 20″
4 Scotch Boilers 14′0″ Mean Dia.
MARINE REVIEW

LONGITUDINAL SECTION OF DREDGER ANCON.

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Scotch boilers, 14 ft. diameter by 12 ft. in length, supply steam at a pressure of 150 lbs., each boiler having three corrugated furnaces of Morrison type 42 in. in diameter. The total grate area is 295 sq. ft., with a total heating surface of 10,704 sq. ft.

The pumping machinery consists of two compound marine engines of 16 and 32 in. diameter of cylinders, with an 18 in. stroke, driving two direct-connected centrifugal dredging pumps. The dredging pumps have a suction and discharge of 20 in. To each dredging pump is connected a suction pipe pivoted to swing vertically and face aft over the side, one of the pipes on either side of the vessel. Through these pipes the mud and sand is drawn from the harbor bottom to the surface and deposited in two large bins. The water accompanying the mud and sand is drained overboard. The capacity of the bins is 2,000 cu. yds., the bins being placed one forward and one aft of the engine and machinery section. Eight gates on each bin discharge the mud and sand raised, the opening and closing of the gates being operated by steam gear. The suction pipes are handled by means of two steam winches on the lower deck, chain slings being connected from the pipes to the winches by falls. There are two main feed pumps, duplex, with cylinders 9 and 6 in. diameter by 10 in., the bilge pump being of the same size and type. There is a twin air pump to each condenser, the cylinders being of 16 and 30 in. diameter, stroke 18 in. One centrifugal circulating pump supplies water to both condensers.

In addition to the foregoing there is a large steam windlass, steam capstan, and steering gear of Williamson make. The capstan and windlass are of the Hyde Windlass Co.'s make. An electric lighting plant, of 2-15 K. W. dynamos, is installed on the lower deck of the engine room, there being an equipment of 140 16 c. p. lamps, the masthead and side lights being of 50-c. p. In addition there is a search light mounted over the pilot house.

Watertight bulkheads are located between the engine rooms and bins, and forward and aft of bins. The fresh-water supply is carried in a double bottom under the engine rooms. The Ancon will have a crew of 60, all told, the rooms for the men being in the 'tween decks, where their mess, and toilet rooms are also located. The officers will have rooms on the main deck aft, together with mess-room, smoking room, pantry and galley.

The hull is constructed of mild steel throughout, the stern post being of cast steel and the stem of forged steel. The bulkheads on the side of the bins are 4 ft. from the ship's skin, these bulkheads being stiffened and braced vertically and horizontally, heavy adjustable rods connecting the horizontal stiffening angles. An oak fender, 6 by 8 in., runs from forward end of suction pipe to forward bulkhead, the after end being formed to protect the suction pipe, which is 98 ft. in length.

WING WATER BALLAST SPACE.

The Fore River Ship Building Co., Quincy, Mass., is building three steam colliers, the Everett, Malden, and Melrose, for the New England Coal Co. These colliers carry water ballast in enclosed compartments adjoining the main deck, and the skin of the ship for the purpose of steadying them when light. Water ballast carried in the double bottom of this type of ship causes them to roll heavily when light. The collector of customs of Boston recently asked Mr. Eugene Tyler Chamberlain, the commissioner of navigation, as to whether these wing water ballast spaces should be measured as cargo space. Following is Mr. Chamberlain's opinion:

"Sir: The bureau has considered further your letter of May 11, in the matter of the measurement of wing water ballast tanks for three steam colliers (Everett, Malden, and Melrose) under construction by the Fore River Ship Building Co. The president of the company has furnished the bureau with a blue print and statement, giving details of construction to elucidate the diagram forwarded by you.

"These colliers are the first of a new type of vessel for carrying cargo in bulk constructed in the United States, and are a development of the whaleback type, which was the earliest construction adapted for the carrying of bulk cargoes, such as coal or grain, in which the hold can be completely filled without trimming by hand. To secure this object the upper corners of each hold are wholly dispensed with in the whaleback shape. When this type of vessel was increased in size, it was found that water ballast in the double bottom made them so uneasy as to be unseaworthy when light, and it was necessary to add water ballast at the upper part of the vessel. In the type following the whaleback triangular water ballast tanks were added to the exterior of the hull. Following this, for the purpose of further strengthening the construction, these tanks were enclosed within the main part of the hull. They were triangular prisms enclosed between the plating of the main deck, the plating of the shell and the sloping plating forming the boundary of the cargo hold. They are water tight and sufficiently strong to be carried full of water when the vessel is without cargo. They are accessible only through oval manholes 16" x 22", one manhole to each compartment through the main deck. They are not available for the stowage of cargo, stores or fuel.

"In the interest of safe and economical navigation Congress established the principle of excluding water ballast tanks in the measurement of vessels by the Act of March 2, 1895, which, among other exemptions, provided:

"In the case of a ship constructed with a double bottom for water ballast, if the space between the inner and outer plating thereof is certified by the collector to be not available for the carriage of cargo, stores, or fuel, then the depth of the vessel shall be taken to be the upper side of the inner plating of the double bottom, and that upper side shall for the purpose of measurement be deemed to represent the floor timber.

"When the water ballast is carried in the double bottom, the measurement for tonnage begins at the upper side of the inner plating. The same principle is applied and the same desirable results to navigation, promoted by Congress, are attained if, when the water ballast tanks are directly under the deck, measurement for tonnage ends at the bottom of the sloping plating on the under side of these wing ballast tanks. This is also the procedure under British law, which is essentially similar to the law of the United States.

"You may be governed accordingly in measuring the Everett, Malden, and Melrose, provided you can furnish the bureau with a certificate that these wing water ballast tanks are not available for the carriage of cargo, stores, or fuel.

"Respectfully,

"E. T. CHAMBERLIN,

"Commissioner."

The Texas Oil Co. has recently awarded a contract to the Newport News Shipbuilding & Dry Dock Co. for an oil carrier to cost about $600,000, to be 420 ft. long, 52 ft. beam and 30 ft. deep. She will have a single-screw, triple-expansion engine and Scotch boilers, and will be capable of attaining a speed of 11 knots.

The Clinton Ship Building & Repair Co., Philadelphia, recently launched their first vessel, a coal barge for Bernerd Tucker, Philadelphia, which was named Goan. The boat is a sectional barge 56 by 27½ ft. and is of 500 tons capacity each box.

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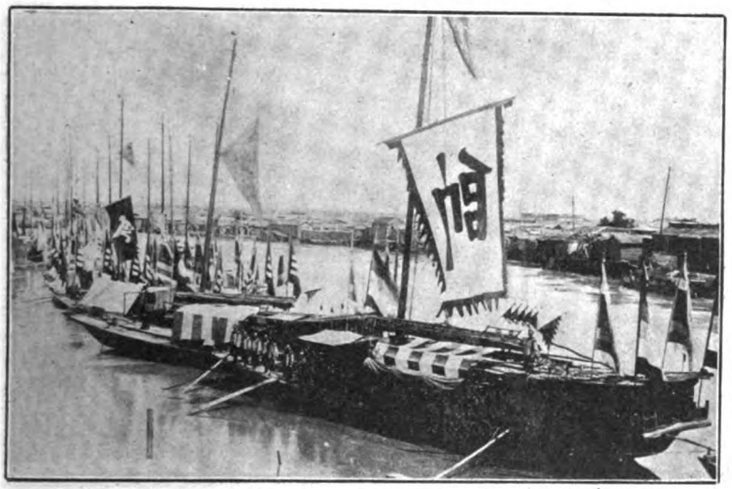
WORK IN COAST YARDS

McIntyre & Henderson, of Baltimore, Md., are to build a tug boat 105 ft. in length for stock.

The J. N. Robins Co., Brooklyn, N. Y., has nearly completed the rebuilding of the Fall River liner Plymouth.



PROCESSION OF CHINESE VESSELS ON A CHINESE RIVER.

William J. Gokey & Co., Brooklyn, N. Y., recently repaired the propeller Halcyon, owned by Capt. J. P. Roberts.

The Morse Dry Dock & Repair Co., Brooklyn, N. Y., recently repaired the bottom of the Standard Oil Co.'s barge No. 76.

The E. W. Heath ship yards, Tacoma, Wash., have recently completed a tug for the Pacific Coast & Norway Packing Co.

The Tietjen & Lang Dry Dock Co., Hoboken, N. J., recently effected repairs to the New Bedford line steamer Pequannock.

The Tietjen & Lang Dry Dock Co., Hoboken, N. J., recently completed repairs to the Metropolitan line steamer Herman Winter.

William J. Gokey & Co., Brooklyn, N. Y., are repairing the schooner Judge Boyce, owned by James Hughes, Philadelphia, Pa.

The Hall Bros. Co., Winslow, Wash., has a contract for building a 53-ft. steamer to cost in the neighborhood of $160,000.

W. E. Thomas & Co., Berkeley, Va., are to repair the lighthouse tender Juniper, giving her a new propeller wheel and minor repairs.

The James Clark Co., Baltimore, Md., has recently installed a new boiler in the Baltimore, Chesapeake & Atlantic Railway Co.'s steamer Joppa.

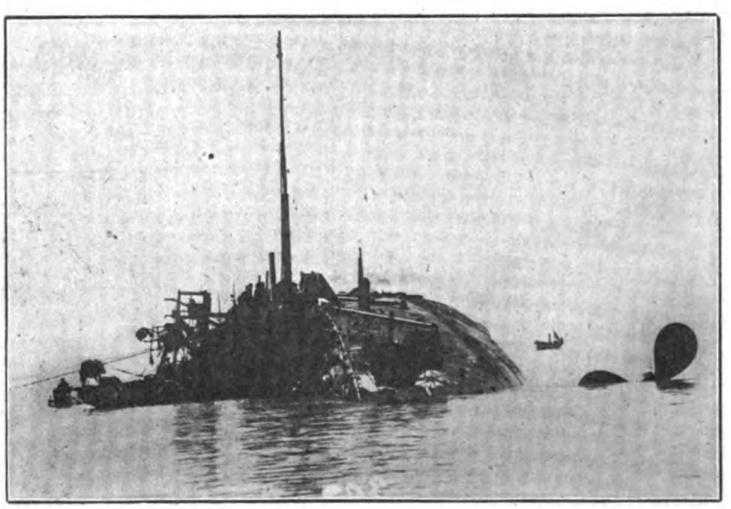
The steamer City of Stamford recently underwent extensive repairs on the dry dock at the yard of James Shewan & Sons, New York, N. Y.

The side wheel steamer T. V. Arrowsmith, of Washington, has recently been repaired at the yard of William E. Woodall & Co., Baltimore, Md.

The Townsend & Moore Engineering Co., Brooklyn, N. Y., recently fitted one of the Brazilian warships with new pumps and gave her general repairs.

The McConnel Engineering & Machinery Co., Tacoma, Wash., has taken over the business of the Puget Sound Dry Dock & Machine Co. of that port.

The Standard Oil Co. recently awarded a contract to the Nilson Yacht Building Co., Baltimore, for an 80-ft. power launch to be equipped with an engine of 100 H. P.



A CAPSIZED RUSSIAN CRUISER ON THE COAST OF KOREA.

The T. S. Marvel Ship Building Co., Newburgh, N. Y., will soon deliver the new steel propeller Sea Gate, built for the route between the Battery and Sea Gate.

The Kelley-Spear Co., Bath, Me., has about ready for launching the first of the three barges which it is building for the New York, Ontario & Western R. R.

The Pusey & Jones Co., Wilmington, Del., have about completed the revenue cutter Pamlico and she will soon leave the yard to undergo her official trial trip.

The Atlantic Transport tug Transport has been at the plant of the James Clark Co., Baltimore, Md., having her engine inspected and new boiler installed.

The big steam dredge Gedney of the United States engineers' department has been receiving a new boiler at the yard of the Brown Dry Dock Co., Jersey City, N. J.

F. S. Bowker & Son, Phippsburg, Me., are building a 500-ton three-masted schooner for Capt. John Trainer. This vessel is to be 137 ft. long, 34 ft. beam and 13½ ft. deep.

The Moran Co., Seattle, Wash., is preparing to launch the steamer Seward for the Northwestern Steamship Co. This vessel is of steel and is to ply between Seattle and Valdez.

The Skinner Ship Building Co., Baltimore, Md., recently launched the first of four 100-ft. tugs which it is to build for the Standard Oil Co. This tug will be known as S. O. No. 16.

The Luckenbach tug Walter A. Luckenbach and the schooner barge West Point, also owned by the Luck-

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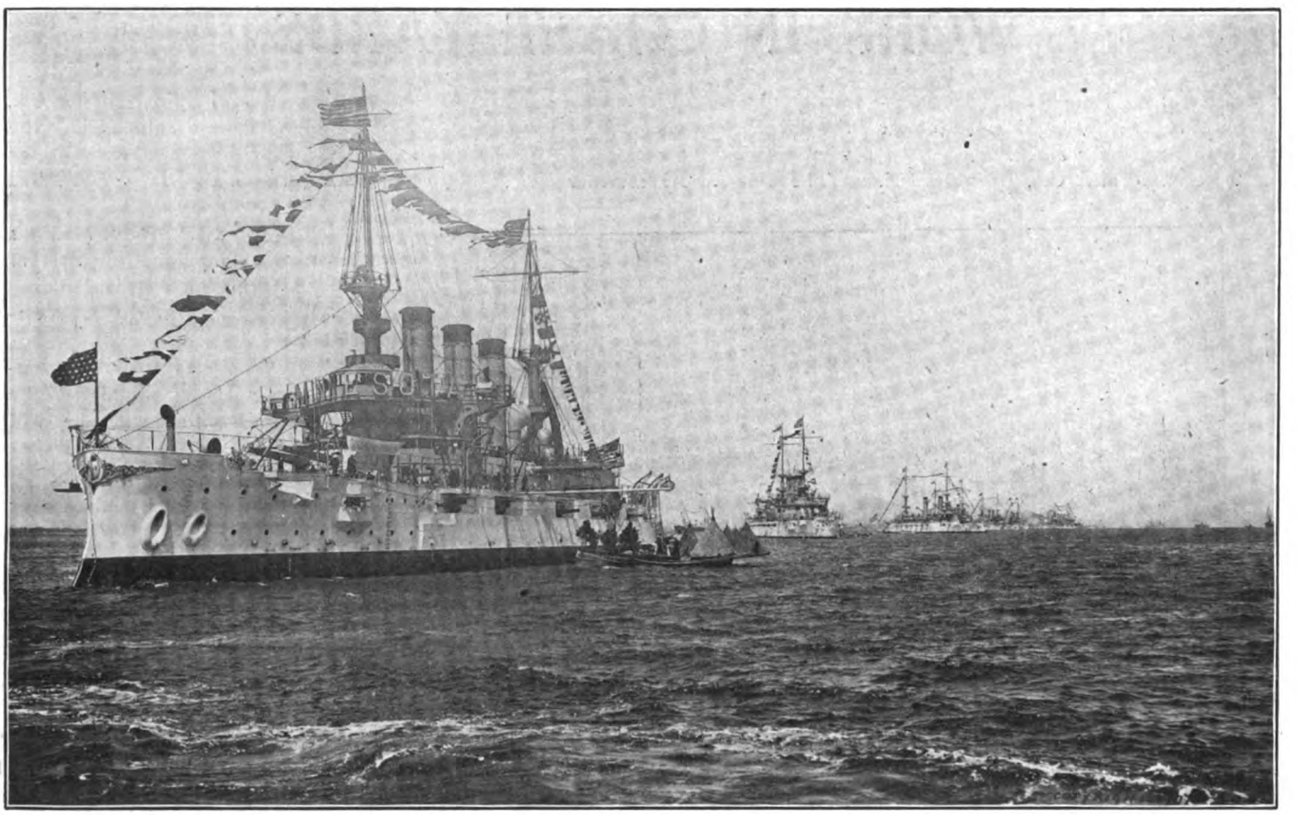

AT THE JAMESTOWN EXPOSITION—THE AMERICAN NAVAL DISPLAY WITH THE BATTLESHIP MINNESOTA IN THE FOREGROUND.

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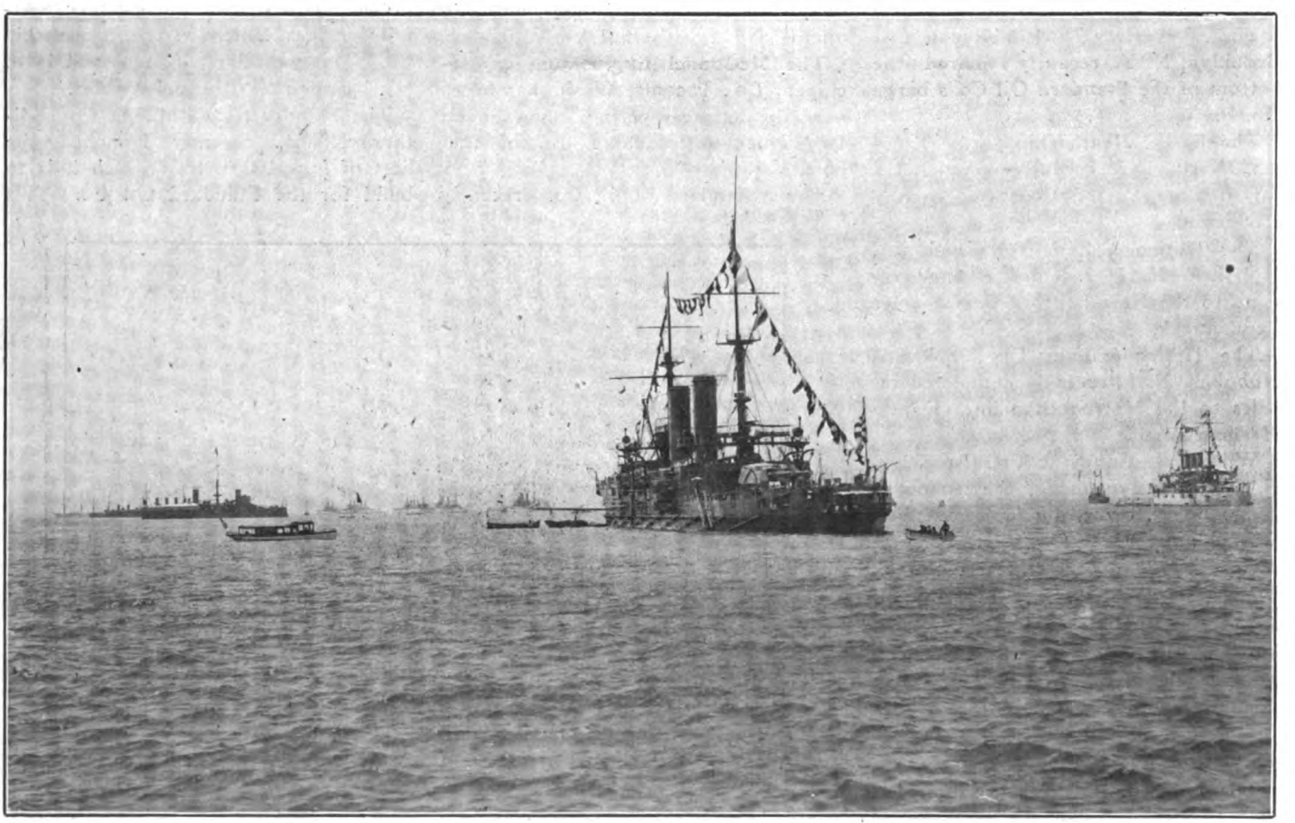

AT THE JAMESTOWN EXPOSITION—THE NAVAL DISPLAY WITH A JAPANESE BATTLESHIP IN THE FOREGROUND.

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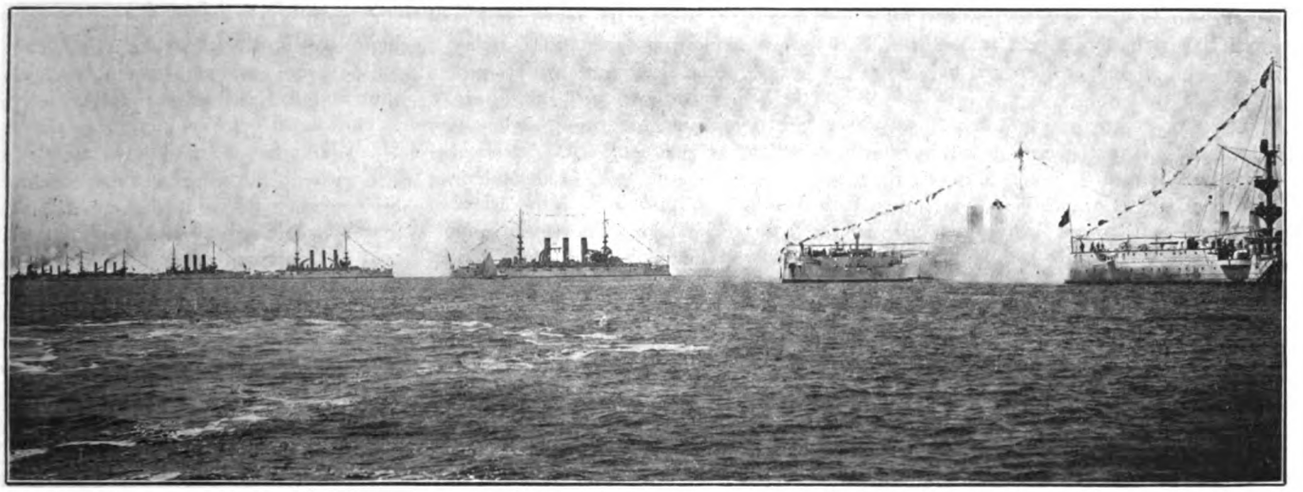

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FIRING A SALUTE AT THE JAMESTOWN EXPOSITION.

enbachs, were recently repaired at the yard of the Pelly Dry Dock Co., Brooklyn, N. Y.

E. W. Heath, ship builder of Tacoma, Wash., has been awarded a contract for the construction of a tug for the Ketchikan Power Co., Ketchikan, Alaska. The tug is to be 73 ft. long and 18 ft. beam.

W. J. Abbot, Milford, Del., has recently completed a small freight propeller for Denny Bros., Penn's Grove, Pa., which is named William Numsen. The engine and boiler will be installed at Trenton, N. J.

The Matthews Ship Building Co., Hoquiam, Wash., have been awarded a contract for the construction of a new steamer for the E. K. Wood Lumber Co. to be 190 ft. long, 36 ft. beam and 12 ft. depth of hold.

The Gilbert Transportation Co., Mystic, Conn., is to rebuild the schooner Ellen M. Baxter, owned by Albert Meyer, San Francisco. The work will be done at the ship yard operated by that company at Mystic.

The Maine Steamship Co.'s steamer North Star has been undergoing repairs at the Quintard Iron Works, New York, and has also been dry docked at the yard of Tietjen & Lang, Hoboken, N. J., for painting and repairs.

Three marine railways are being erected at Pensacola, Fla., by F. M. Daniels & Co. and a ship building and ship repairing plant will be established in connection with the railways, which range in size from 100 to 400 ft.

The repairs to the United Fruit Co.'s steamer Barnstable, which was run into by the schooner Singleton Palmer recently, have been completed at the yard of the Skinner Shipbuilding & Dry Dock Co., Wilmington, Del.

The Commercial Boiler Works, Seattle, Wash., have been awarded a contract for the repairing of the barkentine Alta, owned by A. P. Lorentzen, San Francisco. The Alta's injuries were sustained in a collision with the Fresno.

William E. Woodall & Co., Baltimore, Md., have begun work on the construction of a cargo lighter for the Chesapeake Steamship Co. which is to be 125 ft. in length, 26 ft. beam and 8 ft. deep. The lighter is for use in the harbor at Norfolk, Va.

The Neafie & Levy Ship & Engine Building Co., Philadelphia, are to build a light draft steel tug for the Standard Oil Co., for use in southern waters. The boat is to be 72 ft. long, 18 ft beam and 9 ft. deep. The deck structures will be of wood.

The Neafie & Levy Ship & Engine Building Co., Philadelphia, has been awarded a contract by the Philadelphia & Reading Railroad Co. for the construction of a large harbor tug for use at Port Reading. The tug will be christened Bern.

The Harlan & Hollingsworth Corp., Wilmington, Del., has completed the first of three ferry boats for the New York Thirty-ninth street municipal ferry line and the second will soon be ready for service, while the third remains to be launched.

The Matthews Ship Building Co., Hoquiam, Wash., launched the steamer William H. Murphy on June 20. The Murphy is for the Pacific Lumber Co., San Francisco, Cal., and is 195 ft. long, 39 ft. beam and 14 ft. deep. Her capacity is 850,000 ft. of lumber.

The Peary Arctic steamer Roosevelt was on the dry dock of the Shooter's Island Ship Yard Co., Shooter's Island, N. Y., recently for repairs. As soon as Commodore Peary can avail himself of sufficient funds he will venture upon his sixth polar expedition.

The Norfolk navy yard has recently placed in seagoing trim the cruiser Olympia and she will be used by the naval cadets on their summer cruise. The Olympia has been out of commission for two years and will never again be put to any important sea duty.

The Newport News Ship Building & Dry Dock Co., Newport News, Va., has recently rebuilt the revenue cutter Itasca and on her trial trips she showed greatly increased efficiency of power and speed. The Itasca was formerly the gunboat Bancroft.

The Clinton Ship Building Co., Philadelphia, recently launched the steel sectional barge Goan, the first ever built on the Delaware. The barge, which is owned by Bernard Tucker, Philadelphia, is 126 ft. long and is to ply in the coastwise coal trade.

The Bath Iron Works, Bath, Me., are to exhibit a working model of the battleship Georgia in the great civic parade to be held in their city in August to commemorate the three hundredth anniversary of the construction of the first vessel by white men in the United States.

The Merrill-Stevens Co., Jacksonville, Fla., has recently repaired the big government dredge boat Cumberland, stationed in the Savannah district. This yard is now capable of repairing the largest vessels reaching Jacksonville, its new dry dock having a lifting capacity of 4,000 tons.

Deibert Bros., Elkton, Me., were recently awarded a contract by Capt. William Henderson, Philadelphia, for the construction of a sea-going barge to be 175 ft. long, 26 ft. beam and 13 ft. deep and to be built to the rules of the American Bureau of Shipping for classification in the Record.

Three coal lighters are being built by the Southern Shipbuilding Co., Jacksonville, Fla., to the order of the Havana Coal Co., Havana, Cuba. Two

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of the boats are built of yellow pine, each 100 ft. in length, 20 ft. beam and 10 ft. 6 in. in depth, the third being 100 ft. by 25 ft. by 8 ft. 6 in.

The new steamer Massachusetts, which was recently completed by the William Cramp & Sons Ship & Engine Building Co., Philadelphia, under contract with the Quintard Iron Works, N. Y., arrived in New York last week to take up her service between New York and Fall River, Mass.

The British Columbia Marine Railway Co., Esquimalt, B. C., is to repair the steamship Northwestern which was wrecked at La Touche, Alaska, some time ago. The bid of the company was $47,000 and the work is to be completed in forty-six working days. The vessel was salved by the Columbia Salvage Association.

The Fore River Ship Building Co., Quincy, Mass., is soon to launch the steamer Everett and is progressing satisfactorily on her sister ships Mystic and Malden. These three vessels are to have a coal-carrying capacity of 7,100 tons each and are building to the order of the New England Coal & Coke Co.

Stone & Bergen, San Francisco, Cal., recently launched the tug Restless for the J. D. Spreckels & Bros. Towboat Co. The vessel is built of wood and is 78.5 ft. long, 19 ft. beam and 9.5 ft. depth. The tug will burn oil for fuel and will register 69 tons. She is now at the Fulton Iron Works where she is to receive her machinery.

The Merchants & Miners liner New Orleans has been sent to the yard of the Maryland Steel Co., Sparrows Point, Md., for extensive repairs. It is said that as soon as the repairs are completed she will be placed on the former Winsor line between Philadelphia and Providence, instead of performing her run on the Savannah route.

The British Columbia Marine Railway Co., Esquimalt, B. C., is to build two steel fishing steamers for the New England Fish Co., Victoria, B. C. They are to be 150 ft. long and will cost in the neighborhood of $160,000. They are to be similar to the New England, although 25 ft. longer. These vessels when completed will bring the total of the company's fleet up to five.

The Newport News Shipbuilding & Dry Dock Co., Newport News, Va., has been awarded the contract for the construction of the new derelict destroyer by the treasury department. The vessel is to cost $244,000, and is to be completed by June 1, 1908. The destroyer is to be 204 ft. in length, 34 ft. beam and 15½ ft. depth and will have a steaming radius of 5,000 miles.

The W. & A. Fletcher Co., Hoboken, N. J., has contracts for the building of a 440-ft. steamer for the People's line to Albany, a twin-screw 115-ft. passenger propeller for the Lake George Steamboat Co., a beam engine wooden ferry boat 155 ft. in length for the Tottenville and Perth Amboy line, a 330-ft. steamer for the Citizens line and is completing the two large turbine steamers Yale and Harvard.

The American Car & Foundry Co., Wilmington, Del., are constructing ten wooden hull barges, of which eight are for the Pennsylvania railroad, the two remaining being for the Coastwise Dredging Co., Norfolk, Va. Those for the Pennsylvania are for coal-carrying purposes and vary in size from 800 to 1,000 tons. The dredging company's barges are to be used for dump scows and are of 1,200 gross tons each.

The Fore River Shipbuilding Co., Quincy, Mass., is constructing a tugboat for the New York, New Haven & Hartford R. R. Co. for New York harbor service. She is to be known as Yard No. 146 and is 111 ft. 10½ in. long, 26 ft. beam and 14 ft. 6 in. deep. She is to be fitted with one engine with cylinders 20 and 48 in. in diameter and 28 in. stroke and will have one boiler, 15 ft. 3 in. diameter by 12 ft. 6 in. long.

The Standard Oil Co.'s whaleback steamer City of Everett will shortly be laid up at the Erie Basin Dry Dock, Brooklyn, N. Y., where she will have two new boilers of 15 ft. front installed to take the place of the four at present in use. The new boilers were built by the Harlan & Hollingsworth Corp., Wilmington, Del., and are to be put in place by removing the side of the vessel instead of lowering from above as is usual in such cases.

The W. & A. Fletcher Co., Hoboken, N. J., has been awarded a contract for building the new steamer for the Hudson Navigation Co., operating the Citizens line between New York and Troy. The boat is to have a steel hull and will be 330 ft. long, 42 ft. beam and 13 ft. 9 in. depth of hold. She will be equipped with a simple vertical beam engine, having a 70-inch cylinder, 12 ft. stroke. Steam will be supplied by four tubular boilers.

William E. Woodall & Co., Baltimore, Md., have launched what is said to be the largest six-pocket mud scow ever built in a Baltimore ship yard. The scow is 126 ft. long, 36 ft. beam and 14 ft. deep and was built for the Columbia Dredging Co., New York, to be used in their Providence contracts.

A gasoline boat 100 ft. long is to be built by a Port Arthur, Tex., boat builder for service between Port Arthur and Lake Charles.

The monitor Wyoming is at the Mare Island, Cal., navy ward, being fitted with oil-burning apparatus and will be ready to make a trial trip in September. She will also be equipped with coal burning apparatus, thus protecting her from the possibility of finding herself at some distant port where oil could not be had and so unable to continue her voyage. The experts who have given study to the problem are confident that the Wyoming will prove a success under her new fuel.

The Newport News Ship Building & Dry Dock Co., Newport News, Va., is adding two large fireproof buildings to its plant and also making other improvements. It is expected that dry dock No. 3 will be completed this winter and the new steel ship trestle on the extreme north side of the yard is already nearly completed. Work will soon be begun on new ship stocks to be located near the trestle, where it is expected that ships can be laid down in three or four months.

The ship yard of John H. Dialogue & Son, Camden, N. J., presents a busy scene with no less than eight steel vessels under construction. Among the vessels are the following: The 185-ton tug Patchogue for the Long Island R. R.; the 240-ton tug Ariosa for Dubois Bros., New York; two 420-ton tugs for the New York, Ontario & Western R. R., to be called Western and Ontario; a tug of 292 tons for James McWilliams, New York; and two big tugs destined for the Pacific coast.

Crawford & Reid, Tacoma, Wash, are building a steamer for the Shelton Transportation Co. which is to be named the S. G. Simson. This vessel measures 117 ft. in length, 22 ft. 10 in. beam and 5 ft. 11 in. deep. Her machinery is being constructed at the plant of the Willamette Iron & Steel Works, Portland, Ore., and will consist of a pair of 13 x 72 high pressure cylinder engines, steam to be supplied by a fire box boiler. The estimated speed of the Simson is 15 miles an hour.

The Maryland Steel Co., Sparrows Point, Md., is building two sea-going suction dredges for the government work at the Panama canal entrances. They are to be named Ancon, to be stationed at the Pacific end of the route, and Culebra, to remain on the Atlantic side. These vessels are of 2,500 tons each. The same company is also constructing three other suction dredges for the canal commission

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which are to be erected in the yard and then knocked down and sent to Panama aboard a steamer. These are each of 900 tons but are without motive power.

The battleship Connecticut was docked at the navy yard, New York, on June 18, and an examination made of her hull to ascertain what injury she had sustained when she ran aground last February on a reef off Culebra Island. It was found that between the bilge keel and the docking keel on the starboard bow four of the half-inch steel plates for a length of about sixty feet had been more or less badly damaged, but none of them showed an actual break. It is not certain that the damaged plates will be replaced at present, but the hull of the vessel is being cleaned and painted.

The new passenger steamer City of Savannah, building for the Ocean Steamship Co., was launched June 11 at the yards of the Delaware River Ship & Engine Building Co., Chester, Pa. The dimensions of the new steamer are as follows: Length on 20-ft. water line, 376 ft.; length over all, 403 ft.; breadth of beam, molded, 49 ft.; depth, molded, 27 ft. The gross tonnage will be about 5,900 tons, or 350 tons larger than her sister ships, the City of Atlanta and the City of Columbus. The vessel will go into commission about Sept. 1, running in the regular freight and passenger service of the Savannah line.

The Burlee Dry Dock Co., Port Richmond, Staten Island, N. Y., recently launched the tug Standard II, built for the Standard Oil Co. The new boat is of steel throughout and is equipped with all the modern appliances necessary for a boat of that class. The dimensions are as follows: Length, 152 ft.; breadth of beam, 26 ft.; depth of hold, 16 ft. The engine is triple expansion, with cylinder diameters of 17, 25 and 43 in., with 30 in. stroke. Steam is to be supplied by a steel Scotch boiler 15½ ft. in diameter and 12 ft. long, having four furnaces and allowed a pressure of 180 pounds. The tug is fitted with steam steering gear, a powerful electric plant and all necessary fire and wrecking pumps.

There are under construction at this date for the Consolidated Steamship Lines Co., known as the Morse interests, nine vessels of which three, the Camden, Yale and Harvard are fitted with turbine engines. The apportionment is as follows: The Brazos for the Mallory line, building by the Newport News Ship Building & Dry Dock Co.; the Yale and Harvard, now receiving their machinery at the W. & A. Fletcher Co.'s yard; a freight steamer for the Clyde line, building by the William Cramp & Sons Ship & Engine Building Co., Philadelphia; the steamer Washington Irving for the People's line and a steamer for the Citizens line, which are being built by the New York Ship Building Co., Camden, N. J., and the T. S. Marvel Ship Building Co., Newburgh, N. Y., respectively, and which are to be engined by the W. & A. Fletcher Co.

The steamship Old Colony, building by the William Cramp Ship & Engine Building Co., Philadelphia, under a contract with the Quintard Iron Works, New York, for the New England Steamship Co., a subsidiary of the New Haven & Hartford Railroad Co., was successfully launched June 26. The Old Colony is a sister ship of the Massachusetts and Bunker Hill, with the exception that the Old Colony is propelled by turbine machinery. These steamers were designed to maintain a seventeen-hour service on the outside route between New York and Boston. The Massachusetts is already in service and the Bunker Hill is about finished and ready for delivery. These three vessels will be carefully observed to determine the merits of the turbine and reciprocating types of propelling machinery as they are exactly alike with this exception and are to perform the same service.

Thomas McCosker & Co., Baltimore, have received an order from Philip Weaver & Sons, Baltimore, for building a wooden tug boat 110 ft. long, 23½ ft. beam and 11 ft. depth of hold. The craft is to have two masts and as she will be fitted for deep sea towing she will have electric lights, searchlight, fire and wrecking pumps, machine to make ice, steam windlass, capstan and steering gear. The deckhouse is to be built of steel. The Harlan & Hollingsworth Corp., Wilmington, Del., is to build the machinery. The engine will be compound, with cylinders 18 and 34 in. diameter and 24 in. stroke. Steam will be supplied by a large steel boiler tested to 160 pounds pressure.

The former lake steamer Ravenscraig, which has recently arrived on the coast is to be overhauled and altered at the yard of the Burlee Dry Dock Co., Port Richmond, S. I., N. Y. She will be fitted for carrying coal and when completed will embody many novel features, being probably the most convenient vessel for loading coal or other similar cargoes on the Atlantic coast. The work will be done under the supervision of Matteson & Drake, naval architects, New York, by whom the plans for the alterations were prepared.

ELECTRICITY ON NEW CUNARDER MAURITANIA.

An unusual interest attaches to the electrical installation that is just now being put into the new Cunarder, the Mauritania, on account of the great variety of uses to which electricity is being put and the exceptionally large size of the plant. When she is completed, as she will be in the course of a few months, her generating station will have a bigger plant capacity than many a public lighting station has been able to boast of during its first few years. For instance, for lighting purposes only, there will be something like five thousand lamps of 16 candle power, and to these we must add radiators on the luminous lamp principle for heating purposes. The electric motor is to render service in the operation of a great deal of auxiliary machinery, such as forced draught stokehold fans, refrigerating machinery, passenger hoists betwen the various decks, and a number of luggage and stores hoists. The lifeboats will be raised and lowered electrically, and the variety of operations inseparable from a bakery and pantry will fully use electrical agency. It is said that for the purpose of ventilation between fifty and sixty large electric fans will be employed. Telephone apparatus and electric bells are essentials that, of course, will be largely in vogue, both in the general service of the ship and for passengers' convenience. Electric search lights are indispensable on a modern vessel of any size, and the Mauritania will have four powerful ones, while electricity will also do the masthead and side light illumination. From the bridge it will be possible to close electrically all the watertight doors throughout the ship. As to the plant for supplying the energy for all these purposes, this will consist of four turbo-generators of about 440 kilowatts capacity each; these generators are placed in pairs apart, so located and installed that, thanks to watertight bulkheads, their supply will not fail in the event of flooding of the engine room occurring. How important this is needs no pointing out.

The Locke Regulator Co., Salem, Mass., has just issued a catalog descriptive of the Locke automatic engine stop and speed limit system. The Locke automatic engine stop permits the immediate stop of the engine from any part of the plant and makes a fly wheel explosion absolutely impossible. The catalog is well illustrated and will be mailed to anyone upon request.

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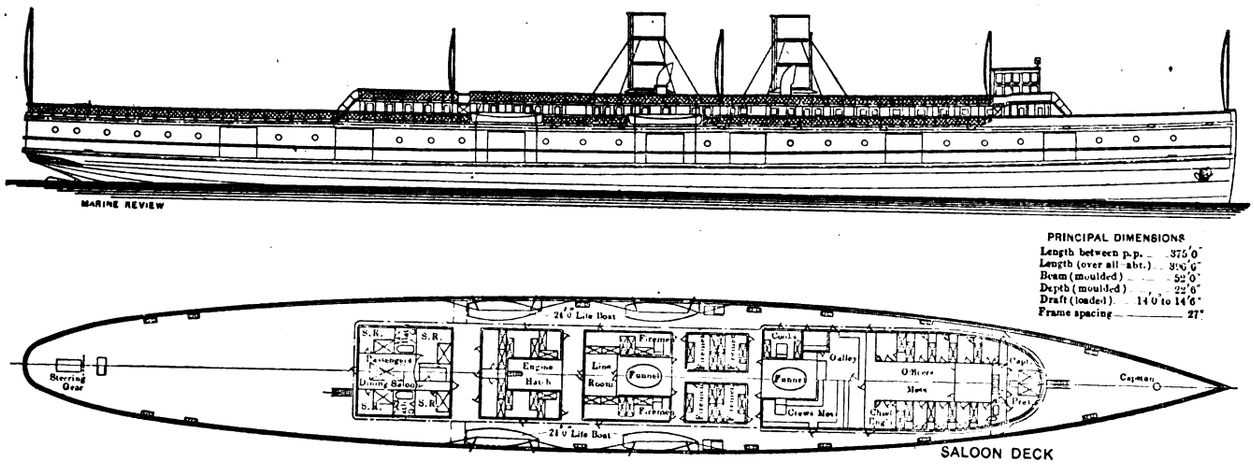

PROFILE AND DECK PLAN OF THE STEAMER MASSACHUSETTS.

LOG OF MASSACHUSETTS.

The MARINE REVIEW, in the issue of June 13, devoted some space to a description of the trial run of the Massachusetts, of the New England Steamship Co., giving particulars of the new steamer's record-breaking trip, and comparative results of other fast steamers in the Long Island Sound route. Through the courtesy of Mr. Stevenson Taylor, of the Quintard Iron Works Co., we are enabled to place before our readers abstracts from the logs of the record holders Metropolis, Puritan, and Massachusetts.

METROPOLIS, JUNE 19, 1855.

	Clock Time.		Elapsed Time.
			H. Min.
Left N. Y., Pier 3, N. R.	5:09	P. M.	
Passed Throggs Neck	6:00	"	0:51
" Sands Point	6:18	"	0:18
" Eatons Neck	7:18	"	1:00
" Stratford Shoal	8:09	"	0:51
" Faulkners	9:23	"	1:14
" Little Gull	10:43	"	1:20
" Watch Hill	11:18	"	0:35
" Point Judith	12:20	A. M.	1:02
Arrived Newport	1:00	"	0:40
Left "	1:46	"	
Arrived Fall River	2:45	"	0:59

PURITAN, JUNE 8, 1899.

	Clock Time.		Elapsed Time.
			H. Min.
Left Rutgers St., E. R.	9:25	A. M.	
Hunts Point	5:59½	"	0:34½
Throggs Neck	10:13½	"	0:14
Passed Execution Rks.	10:32½	"	0:19
" Captain's Isd.	10:55½	"	0:23
" Eatons Neck	11:29½	"	0:34
" Stratford Shls.	12:18½	P. M.	0:49
" Faulkner's Isl.	1:30½	"	1:12
" Cornfield L. S.	2:09	"	0:38½
" Plum Isl.	2:29	"	0:20
" Little Gull	2:44	"	0:15
" Watch Hill	3:23	"	0:39
" Point Judith	4:19	"	0:56
" Brentons Reef L. S.	4:42½	"	0:23½
" Castle Hill	4:49	"	0:06½
" Rose Island	4:56	"	0:07
" Gould Isl.	5:03½	"	0:07½
" Sandy Pt.	5:18½	"	0:15
" Bristol Fry.	5:28	"	0:09½
" Olivers Whrf.	5:46½	"	0:18½
Arrived Fall River	5:52	"	0:05½

MASSACHUSETTS, JUNE 4, 1907.

	Clock Time.		Elapsed Time.
			H. M. S.
Left N. Y., Pier 18, N. R.	3:12	P. M.	
Passed Throggs Neck	4:10	"	0:58
" Sands Point	4:27	"	0:17
" Eatons Neck	5:18	"	0:51
" Stratford Shoal	6:01:20	"	0:43:20
" Faulkner's Isl.	7:05:24	"	1:04:04
" Little Gull	8:12:34	"	1:07:10
" Watch Hill	8:45:50	"	0:33:16
" Point Judith	9:35:29	"	0:49:39
" Rose Island	10:10	"	0:34:31
Arrived Fall River	11:00:00	"	0:50:00

Running time, New York to Fall River:—Metropolis, 8 hrs. 50 mins.; Puritan, 8 hrs. 27 mins.; Massachusetts, 7 hrs. 48 mins.

The Massachusetts, the contract for which was awarded by the New England Navigation Co. to the Quintard Iron Works Co., of New York, the designers, left the yard of William Cramp & Sons, Philadelphia, early in June. The hull was constructed and engines installed in Philadelphia.

The general dimensions of the Massachusetts are: Length on water line, 375 ft.; length over all, 396 ft.; molded beam, 52 ft., and molded depth, 22 ft. Her machinery installation consists of two sets of four-cylinder triple-expansion engines, with cylinders of 26, 43, 51 and 51 in. diameter; stroke, 42 in., with an indicated horsepower of 7,500. She is equipped with eight single-ended boilers, each 14 ft. 9 in. by 11 ft., and is fitted with forced draft. The steam steering gear is supplied by Williamson Bros., of Philadelphia, all the equipment being of the best and latest type, including a wireless telegraphy outfit. Three steam freight elevators handle the cargo, the whole of the main deck being given over to cargo space, for which there is accommodation for 1,500 tons. The officers and crew are provided with quarters on the upper deck, limited passenger accommodation being on the same deck. A spacious promenade deck is in the after part of the vessel. There are four 24-ft. lifeboats on the upper deck.

The Massachusetts is the first of the three fast freighters, building for the New England Navigation Co. to go into commission. The Bunker Hill, sister ship to the Massachusetts, is expected to leave the yard early in July.

The Old Colony, the last of the fleet to go into commission, was launched at the yard of William Cramp & Sons on Wednesday, June 26, at 2:30 p. m. Mrs. Isabel Taylor Ball, wife of Mr. Ancell H. Ball, of New York, and daughter of Mr. Stevenson Taylor, christened the vessel, the launching party accompanying Mrs. Ball from New York.

Unlike the machinery installation of the other vessels, the Old Colony will be equipped with three Parsons marine turbines, the turbines being constructed at the Quintard Iron Works Co., and will have triple screws. She will be similar to the others in boiler power.

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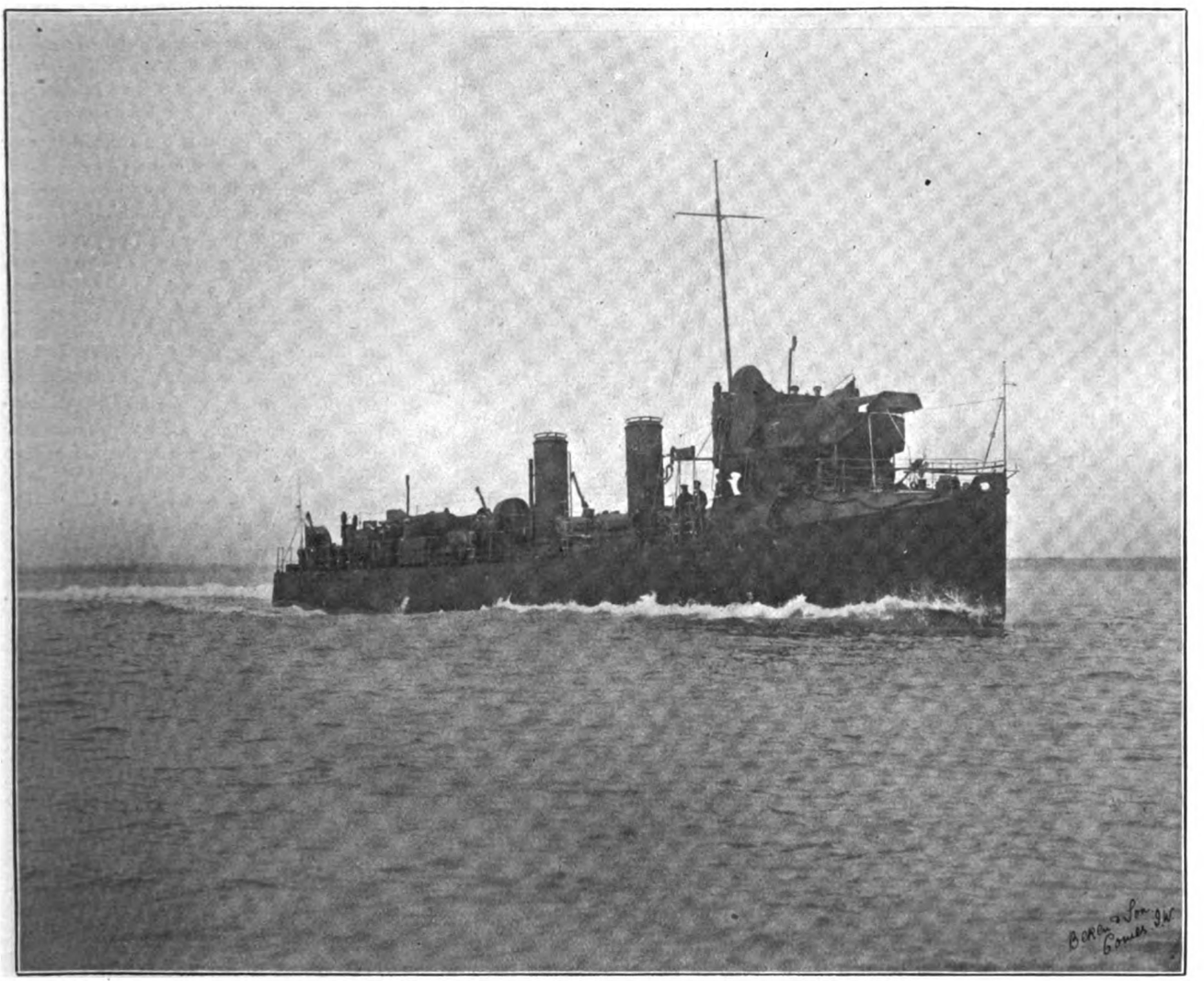
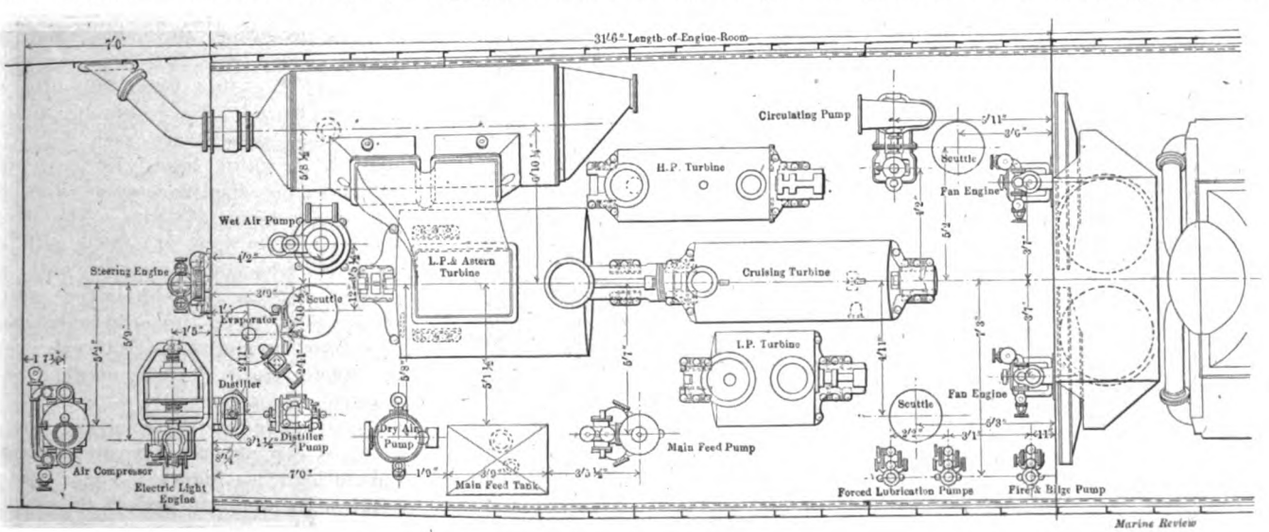


OIL-FUEL, TURBINE-DRIVEN, 26-KNOT TORPEDO BOAT FOR THE BRITISH NAVY.

OIL-FUEL TURBINE-DRIVEN TORPEDO BOATS.

Messrs. J. Samuel White & Co., Ltd., of Lost Cowes, Isle of Wight, have supplied us with the accompanying illustrations of the 26-knot oil-fuel turbine driven torpedo boats which they have built for the British navy, together with views of the high-pressure turbine and the plan of the machinery room. These represent a new series of boats, of which 24 have been laid down since the first were ordered under the naval program of 1905-6. It having been con-



ARRANGEMENT OF MACHINERY OIL-FUEL, TURBINE-DRIVEN, 26-KNOT TORPEDO BOAT.

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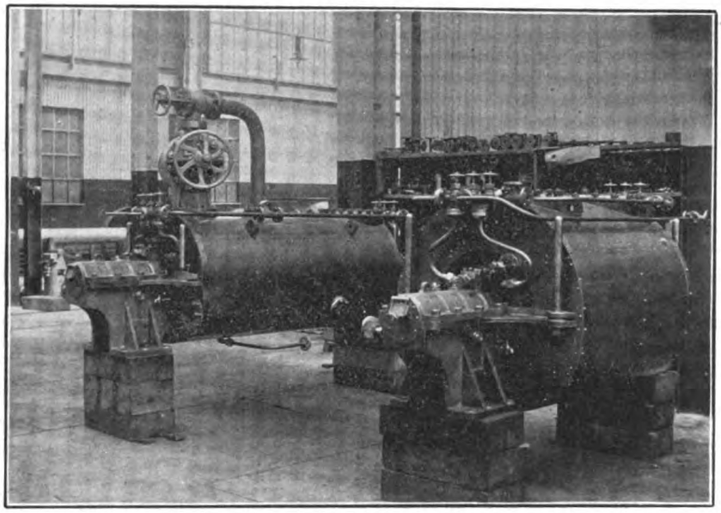
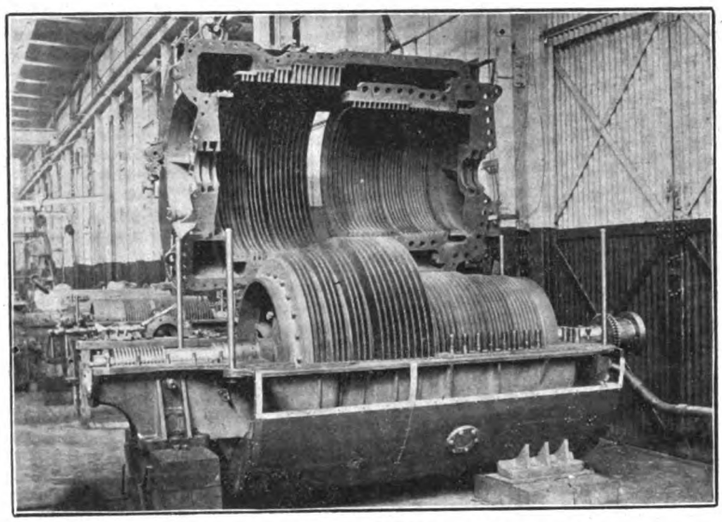


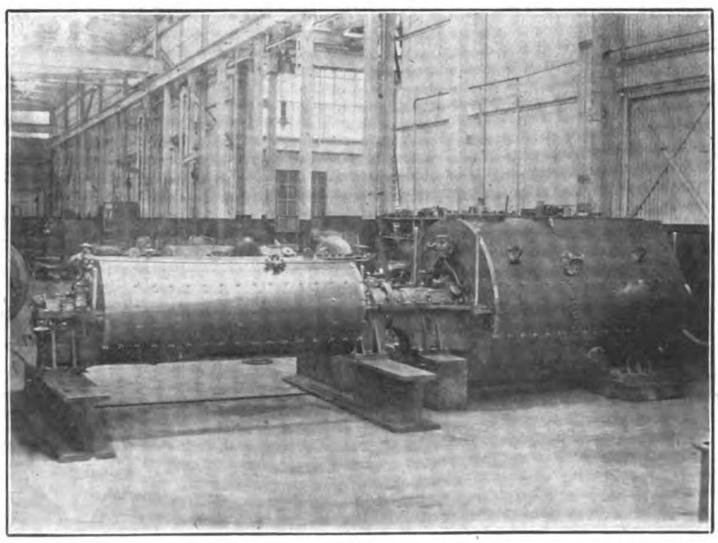
OIL FUEL TURBINE. THE HIGH-PRESSURE AND INTERMEDIATE PRESSURE AHEAD TURBINES.

sidered that a superior type of boat was necessary for even the tactical work undertaken by purely torpedo craft, in contradistinction to the over-sea offensive work of destroyers, the Board of Admiralty decided to introduce a new class propelled by turbine engines. At the same time the committee appointed to investigate the advantages of oil-fuel had solved the difficulties of the system, not only as regards the best means of vaporizing the fuel, but also of completely consuming it, and the new boats were therefore designed with boilers to use liquid fuel. Originally Messrs. White & Co. secured an order to build five vesesls of this class, but the firm has so kept pace with the requirements of the naval strategist, and its vessels have been so strikingly successful that out of 32 of the modern torpedo craft with oil-fuel and Parsons turbines, ranging from 26 to 36 knots speed now under order, 11 are being built by the Isle of Wight firm.

At the outset, in constructing the first order of five vessels, Messrs. White & Co. had to solve the problem of securing the minimum scantlings for the hulls with absolute oil-tightness in those parts in which the fuel was to be stored. A complete series of experiments were entered upon, culminating in the construction of a short length of vessel, of the full section, in order to practically test the system of riveting proposed. This enabled the constructional details to be settled and this enabled other firms to follow on the same lines. This difficulty having been overcome, rapid progress was made with the construction of the first five



OIL FUEL TURBINE—THE CRUISING TURBINE WITH TOP COVER OFF.



OIL FUEL TURBINES OF THE LOW-PRESSURE AHEAD AND ASTERN TURBINE COMBINED.

vessels, and all the boats were delivered before the contract date, the first anticipating the time by a month, while the fifth was handed over on May this year, fully three months before the contract time. These five vessels are each 175 ft. long, 17 ft. 6 in. beam, 10 ft. 9 in. in depth, the displacement at 5 ft. 8 in. draught being 245 tons. The vessels, as will be seen, are fitted with a high whale-backed forecastle, with a bridge carrying a 12-pounder gun, while the three torpedo-launching tubes are mounted at intervals on the middle line. There is another 12-pounder gun aft.

The feature of these ships, however, is the steam generating plant and turbine machinery. The boilers adopted by the firm are of the well-known White-Forster type. The details of the oil-fuel instalation, the result of costly experiments by the

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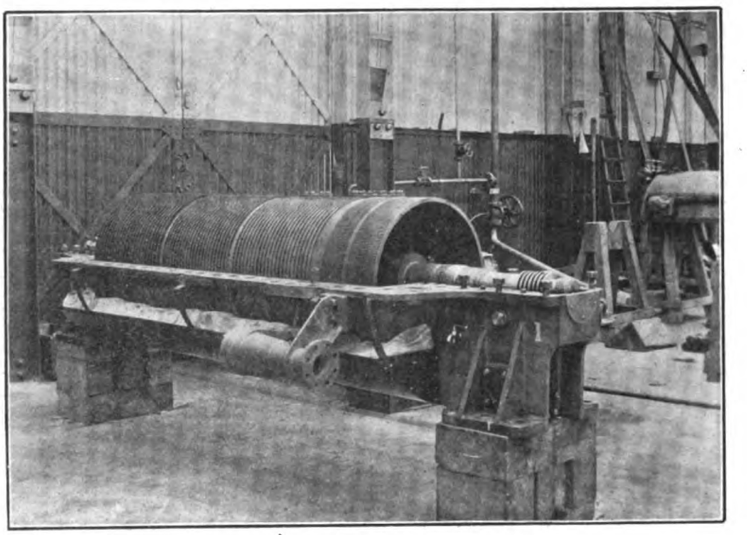
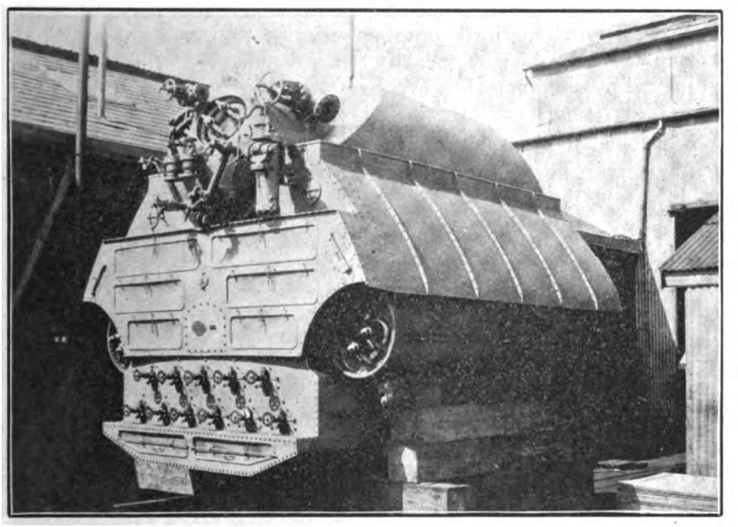
Admiralty, are kept secret. The relation of grate surface to heating surface in the White-Forster boilers in these vessels is 1 to 60 sq. ft., and the practice in liquid fuel installations is to provide 2 sq. ft. of heating surface for the equivalent of 1 I. H. P. The boilers have proved very satisfactory in these vessels, to which fact testimony is borne by the boiler being bracketed as an alternative type with the Zarrow boiler in the specification for the new high speed cruiser Boadicea, which is being built at Pembroke as a mother-boat for torpedo craft. There are two boilers in each torpedo boat, and these are accommodated in one stokehold, the fans for which are driven by engines in the engine-room under the immediate observation of the engineer. The shaft passes through a stuffing-box to the bulkhead.



THE CRUISING LOW-PRESSURE TURBINE.

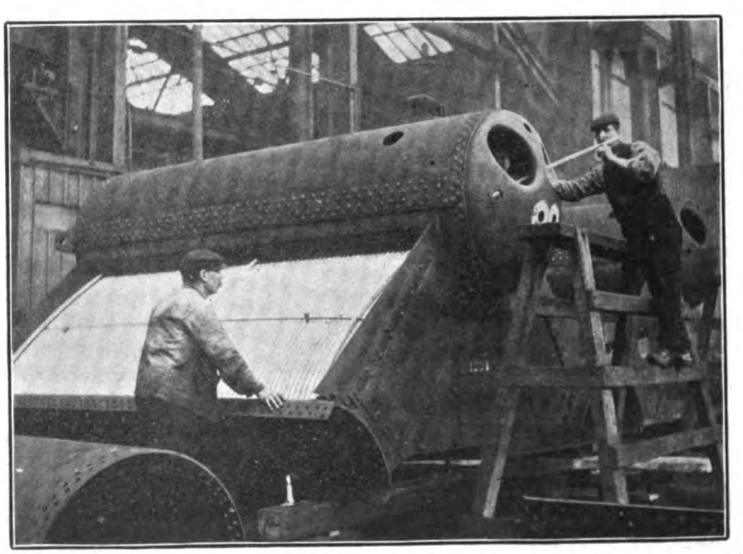


WHITE FORSTER WATER-TUBE BOILER SHOWING LIQUID FUEL BURNERS AND FEED WATER REGULATOR IN POSITION.

The general plan shows the engine arrangement. On the center shaft the illustrations show a cruising turbine, and a low pressure ahead and astern turbine, the latter two within one casing. On the port-wing shaft there is a high-pressure ahead turbine, and on the starboard side an intermediate pressure ahead turbine. All four ahead turbines are in use for speeds up to 16 knots, steam from the boiler being passed to the cruising turbine, thence to the high-pressure turbine on the port shaft, to the intermediate pressure turbine on the starboard shaft, to the low-pressure turbine on the center shaft, and, finally, to the condenser, which is placed on the port side of the ship. This arrangement of four compound turbines gives a great range of expansion, and has resulted in satisfactory economy even at low powers. For speeds above 16 knots the steam is shut off from the cruising turbine, which then works in vacuo, and passes direct to the high pressure turbine, thence to the intermediate, the low pressure and finally to the condenser. The turbines which were constructed by Messrs. J. Samuel White & Co. are bladed on the Parsons system and the details correspond with those generally adopted in torpedo craft.

The contract called for the maintenance of a speed of 26 knots during an eight hours' run, with 21 tons of oil fuel on board, and all five vessels easily maintained this condition. The mean result of the five boats were as follows:

Speed on measured mile.....	27.107 knots.
Mean speed for 8 hours.....	26.36 knots.
Consumption of oil for 8 hours	20.758 tons.
Distance run per ton of fuel at a speed of 12.147 knots	37.90 nautical [miles.



METHOD OF TUBING WHITE FORSTER'S WATER-TUBE BOILER.

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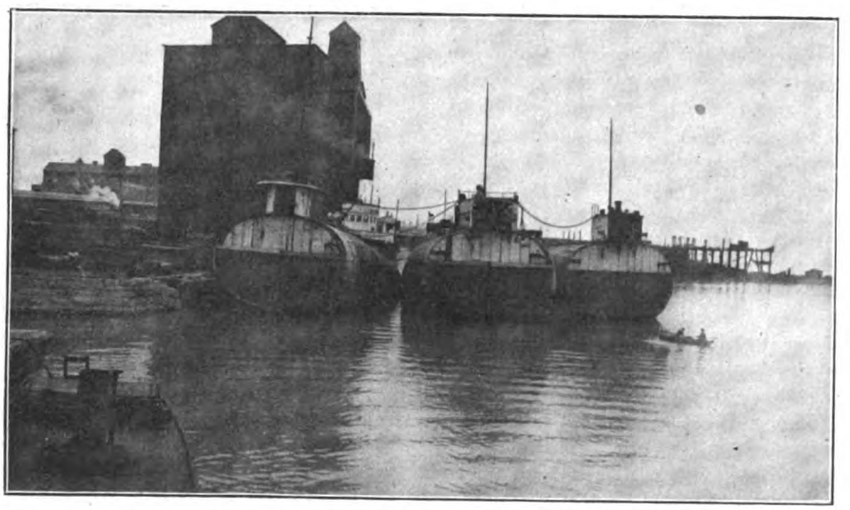
It should be noted that as the depth of water at Stokes Bay where the trials were run is not quite adequate for such high speeds, the vessel will, in deep water, exceed the 27.107 knots attained on the measured mile. The consumption of oil averaged just under 2.6 tons per hour for 26.36 knots. It will be noted also that at 12 knots the vessels steamed 37.90 nautical miles for each ton of fuel consumed, whereas the guarantee under the contract was 32 nautical miles, so that here, as in the matter of speed, there was a considerable margin over the stipulated condition.

Messrs. White & Co. are building four more vessels of this type, the dimensions having been slightly increased—the length by 7 ft., the beam by 6 in., and the displacement by 10 tons—so that the new vessels are 182 ft. long by 18 ft. beam, and at 5 ft. 10 in. draught they will displace 256 tons. The estimated horsepower to give them 26 knots is 4,000 H. P. Two 33-knot destroyers are also in course of construction. These are 272 ft. by 26 ft. and at 8 ft. 8 in. draught the displacement is expected to be about 900 tons. To obtain 33 knots about 15,500 I. H. P. will be required. Five other vessels of this class are being built in addition to a 36-knot destroyer by other firms, and the performances of these various vessels on trial will be looked forward to with considerable interest.

WHALEBACKS GOING TO COAST.

The accompanying views illustrate some work recently carried out upon the whaleback steamer Bay City and barges Bombay and Baroness—vessels originally built for the great lakes trade but having outlived their usefulness in that sphere have been secured for the East Coast Coal trade between Newport News, Va., and Boston, Mass., by the Sprague Transportation Co. of the latter port.

To enable the vessels to reach their new port of registry, it was found necessary to cut off some 30 ft. from the bow end of each. After surveying the vessels and comparing their dimensions with the Welland canal locks it was found that the latter could be navigated by opening one canal lock gate at a time, and bringing the fore end of vessels hard over to lock wall port and starboard in turn, thus clearing radius of lock gate when closing and thus obviate disturbing the forward collision bulkhead in each vessel. The contract for cutting off bow ends, and marking and stowing all material in such a manner that reconstruction could be readily carried out, was placed with



BOWS CUT OFF READY TO START FROM BUFFALO.

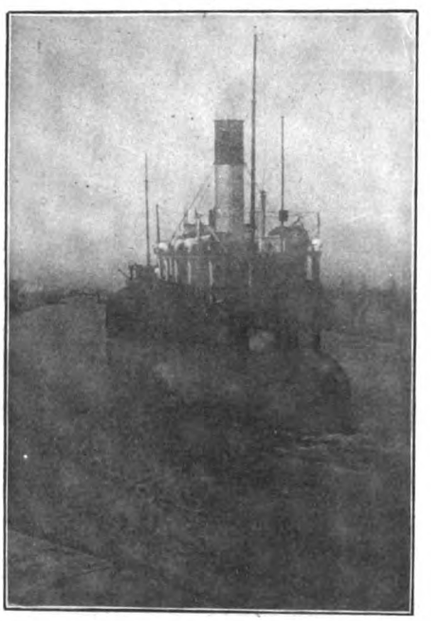
the Empire Ship Building Co., of Buffalo, N. Y., who guaranteed to complete the work specified within twenty-one working days—a penalty of $300 per day obtaining for every day beyond that time.

To obviate docking, all loose gear and weights were placed as far aft as possible lifting the fore ends quite clear of the water to enable the lower

AT ST. CATHERINE'S, ONT. PASSING INTO LOCK NO. 6. WHALEBACK BAY CITY BOW ON.

portion of plate frames, floors, etc., to be taken out.

Numerous gangs of riveters, chippers and riggers were put to work simultaneously upon all three vessels and under the personal superintendence of President John G. Malone and his manager, John Bateman, the



AT ST. CATHERINE'S, ONT. WHALEBACK BAY CITY PROCEEDING TO LOCK NO. 5.

whole of the vessels were finished and water-tested in fifteen working days from their commencement or in six days shorter time than that specified, a highly creditable performance considering the intricate nature of the work, the inclement weather prevailing and unsatisfactory conditions of labor at that time.

Work has just been started at Kobe, Japan, on four great wharves each 1,200 ft. long and 360 ft. wide with a space of 420 ft. between each. The average depth of water will be 36 ft. and 19 large steamers will be able to berth at one time.

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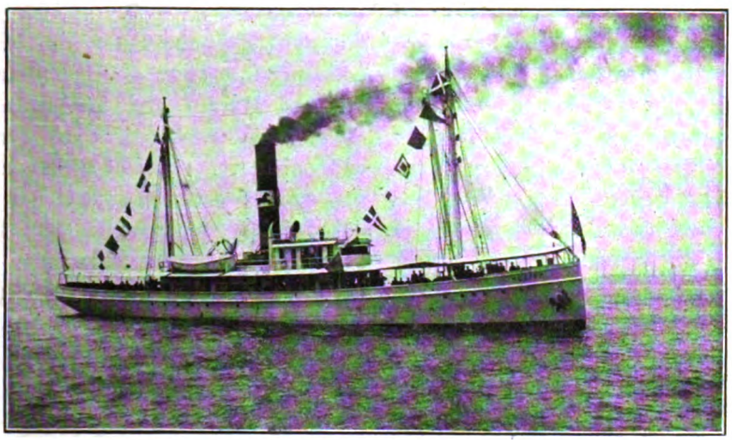
WRECKING STEAMER RELIEF.

On June 21, the new wrecking steamer Relief, built for the Merritt & Chapman Derrick & Wrecking Co., by the Harlan & Hollingsworth Corporation, from the plans and under the superintendence of Horace See, of New York, left New York on the first of her trials.



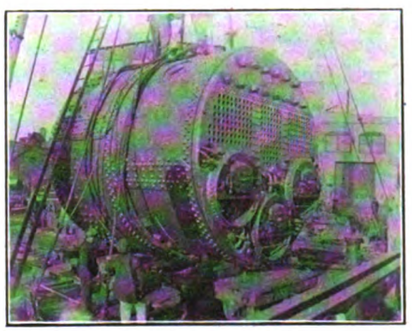
WRECKING STEAMER RELIEF ON HER TRIAL TRIP.

With a steaming radius of 8,000 knots at a steady average of 10 knots per hour, equipped to meet with any demand that may be made on her services as a wrecker, relief, or repair steamer; fitted with evaporating-distilling and cold storage plants; electric lit throughout and with unexcelled accommodation for her propeling and wrecking crew, the Relief is the finest of her type yet produced.

Her principal dimensions are: Length over all, 200 ft.; breadth molded, 30 ft.; depth, molded, to main deck, 20 ft. The hull is built entirely of steel, has two continuous decks, a double bottom extending the full length of the vessel, and has bilge keels fitted. At the hatches on deck the usual gear and hoisting engines are fitted for handling cargo. In addition to these there is a large steam capstan for handling the towing hawsers, as well as a windlass for the anchors. One of the two life-boats is equipped with power.

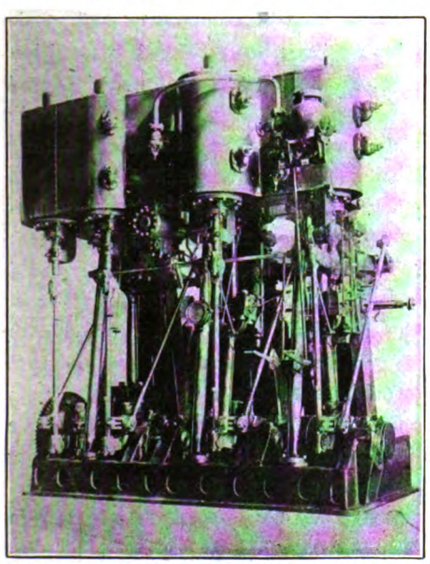
Her machinery installation consists of one triple-expansion engine with cylinders 18 in. diameter for high pressure, intermediate 30 in., and low pressure 50 in.; stroke 30 in. Valve gear of improved radial type. The boilers consist of two single-ended, for main steam, of 12¾ ft. in diameter, length 13 ft., with three corrugated furnaces in each. A double-furnace subvertical water-tube boiler containing 700 sq. ft. of heating surface, on the main deck, is capable of driving the vessel at a speed of six knots per hour. The Relief is built for a speed of 12 knots per hour.

In addition to the pumps working in connection with the main engines, which are all independent, there is a large wrecking pump of the duplex type, with cylinders 18½ in. diameter at steam end, 10½ in. diameter at water end, with stroke 12 in. The steering, reversing and turning gear are steam driven. Two dynamos generate the electricity used for lighting and other purposes, a search light being located on the pilot house, and all running lights connected with an indicator in the pilot house.

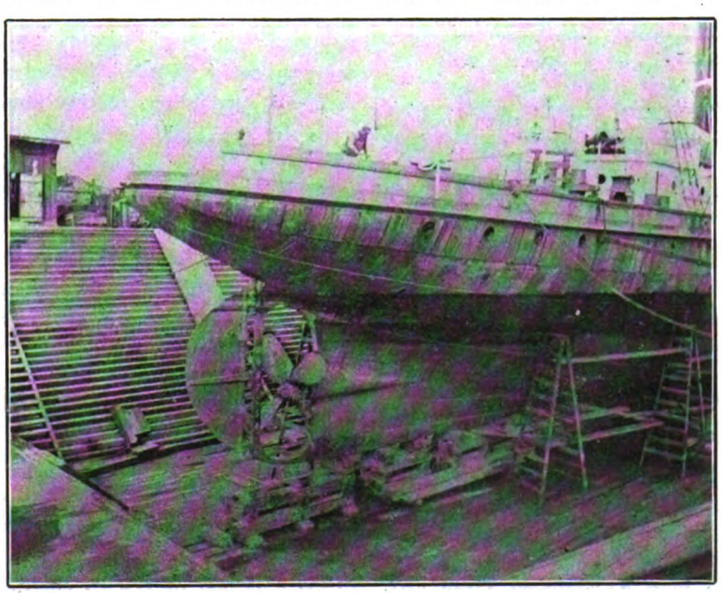


ONE OF THE MAIN BOILERS

An item worthy of special mention is the complete equipment of repairing and overhauling machinery, a power-driven lathe, compressed-air drilling machines, and all other necessary tools being installed. In spite of the necessary compactness and economy of space, at no place is there any overcrowding of machinery or fittings.



ENGINES OF WRECKING STEAMER RELIEF.



WRECKING STEAMER RELIEF IN DRY DOCK AT THE HARLAN & HOLLINGSWORTH CORPORATION, WILMINGTON, DEL.

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THE MARINE REVIEW

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A SUGGESTED BOOK OF TECHNICAL CLIPPINGS.

In perusing a technical paper the engineer will probably take a preliminary glance through the pages with the object of selecting the articles of most interest to him. Having read these articles, those of minor importance follow in due order. The likelihood is that the whole contents of the paper will be read, with more or less interest according to the value of the article and time at the disposal of the engineer, before being discarded.

There may be amongst these articles some matter which the engineer wishes to preserve for future use, in which event the paper is placed on one side, pro tem, perhaps to be finally thrown out with numerous others in the hurry of the owner's departure, or as an inconvenient addition to a marine engineer's baggage.

Most marine engineers have in their possession a note-book in which they jot down, from time to time, any valuable data, formulae, or other information they may find of use in their profession, the size, system, and general appearance of the book being a good indication of its value in the eyes of the owner.

Why not have another book in which could be preserved any matter of value published in the technical papers—a clippings or scrap book?

With the limited accommodation of a marine engineer's cabin it is next to impossible to preserve back numbers of technical papers, loose or in bound form, for the sake of such articles as the engineer considers are of vital interest to him. Of course, where it is not inconvenient to do so, the preserving of the papers in a binder is advisable, but the wanton destruction of the matter of use to the engineer, because the paper cannot be preserved in the whole, is certainly deplorable.

Such a book as is suggested, divided out under various heads, would be invaluable in an engineer's eyes. Articles on engine, boiler, or dynamo construction, gleaned from various sources, could be filed for reference, as could descriptions of the latest designs in the build of merchant and war ships. There are several types of blank books, ledgers, or the ordinary scrap book, which could be used for this purpose, the time expended in clipping and indexing the articles being but a few minutes of the engineer's time off watch.

CARRYING COAL IN FOREIGN SHIPS.

The navy department has recently been chartering British ships to carry coal from Norfolk to San Francisco and Puget Sound ports. This is in direct violation of the coastwise laws of the United States. If any citizen attempted to do the same thing his goods would be confiscated. The reason given by the navy department for this action is that sufficient American vessels are not available to meet the needs of the service. It is also represented that there was a coal famine on the Pacific coast last winter, the navy department being practically obliged to supply at cost government institutions on the Pacific coast in the vicinity of Sitka, Bremerton and Mare Island, and including the light-house board, coast survey and public schools, and consequently the navy department stock was reduced below what would have been permitted otherwise. The navy department adds that it earnestly desires to ship coal and all other naval supplies transported by sea in American vessels, being willing to pay fair rates for transportation.

American ship owners are not at all convinced that the chartering of foreign vessels by the navy department was necessary. Within a year they point to the fact that several American vessels offering to convey naval coal to the Pacific coast have been rejected by the navy department. The difference in price was not material, American vessels having offered to carry the coal at $6.50 per ton, as against $6.25 now allowed foreign ships. The navy department had previously been purchasing foreign coal for from $6.80 to $7.25 per ton, including duty, but the sharp advance in the foreign commodity had made the purchase of this coal prohibitive.

Now this foreign coal was delivered in bounty-fed ships, cutting directly into two American industries—mining and shipping. In purchasing its coal in the United States the navy department has encouraged one department of American industry, but if it would adopt the policy of shipping its coal by American vessels, even if it had to pay a small premium to get them, it would contribute a wide benefit upon the entire country. There would be sufficient American ships offering, or built to offer, if the national government could be persuaded to be fair to the American ship.

ONE YEAR'S SHIPBUILDING.

The total tonnage of merchant vessels built in the United States and officially numbered by the Bureau of Navigation during the fiscal year ended

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June 30, 1907, was 1,463 vessels of 510,865 gross tons, the largest in half a century, and exceeded only twice in American history. Construction in 1855 amounted to 583,450 gross tons, in 1854 to 536,046 gross ton. In those years the tonnage built in the United States greatly exceeded the tonnage built in the United Kingdom.

In the past fiscal year steel steam vessels built in the United States numbered 122 of 360,665 tons, by far the greatest tonnage of this description in our history, and about one-fifth the tonnage built in the United Kingdom. Of these steel steamers, 47 of 238,713 tons were built on the Great Lakes; the Leland S. De Graef of 7,971 tons being the largest yet built for those waters. Fifteen new lake steamers are each over 7,000 tons. In 1903 the largest steamer built on the lakes was 5,600 tons.

The total tonnage and average size of steel steamers built for the coasting trade are the largest in our history. On the seaboard 24 ocean steamers, each over 1,000 gross tons, aggregating 98,028 tons were built, the largest being the Mexican, 8,579 tons, for the new West Hawaiian trade via the Tehuantepec railway. Only two steamers, Havana and Saratoga, each of 6,391 tons, operating under the Ocean Mail Act of 1891 to Havana, were built for the foreign trade.

Four years have now elapsed since a square rigged vessel was built in the United States, and the increase in steam tonnage is accompanied by a decline in the building of schooners. A relatively new type, the schooner, equipped with auxiliary motor power, is appearing.

TWO LAKE LAUNCHES.

The steel freighter Charles O. Jenkins, building for Mr. Charles O. Jenkins, of Cleveland, was launched at the Wyandotte yard of the American Ship Building Co. on Saturday last, and was christened by Mrs. Eugene T. Bush, sister of the man in whose honor the boat was named. The new steamer is 524 ft. over all, 504 ft. keel, 54 ft. beam and 31 ft. deep. She will be ready to go into commission in about three weeks and will be commanded by Capt. William Smith, of Marine City. A large party attended the launching from Cleveland and was tendered a complimentary dinner by the ship building company at the Hotel Cadillac at the conclusion of the launch.

The steel freighter Smith Thompson, building for the L. C. Smith Transit Co., was launched from the yard of the Toledo Ship Building Co., Toledo, on Saturday last. The launching was successful in every way and was witnessed by an unusually large number of spectators. The Thompson is 460 ft. over all, 440 ft. keel, 53 ft. beam and 29 ft. deep. She will be equipped with triple-expansion engines, with cylinders 16½, 24, 35 and 50 in. diameters by 42 in. stroke, supplied with steam by two Scotch boilers 12 ft. 6 in. by 12 ft., equipped with Ellis & Eaves draft and allowed a working pressure of 7,000 lbs. She will be commanded by Capt. Ralph Lyons.

NOTTINGHAM RELEASED.

Capt. W. W. Smith, marine superintendent for the Pittsburg Steamship Co., released the steamer Nottingham at Buffalo last week. The Nottingham was driven ashore during the great wind storm last January. Capt. Smith in releasing the Nottingham used the same equipment that was employed upon the steamer Crescent City which was driven on the north shore of Lake Superior in the great gale of November, 1905. Sixteen 125-ton jacks and four 100-ton purchase blocks were used. A channel had been dug to the Nottingham by the Donnelly Salvage & Wrecking Co., of Kingston, Ont. As soon as the steamer was lifted into deep water she proceeded under her own steam to Toledo, where repairs were made. The vigor with which Capt. Smith attacked this work has been very favorably commented on by vessel owners. He has been very successful in all his work for the Pittsburg Steamship Co. He is now engaged in releasing the Hurlbut W. Smith at Buffalo.

CONTRACT FOR FREIGHTER.

Mr. Charles O. Jenkins of Cleveland has given contract to the American Ship Buidling Co. for a steamer to be a duplicate of the Charles O. Jenkins which was launched at Wyandotte on Saturday last. The new steamer will therefore be 524 ft. over all, 504 ft. keel, 54 ft. beam, and 30 ft. deep, and will have triple expansion engines and Scotch boilers. It is understood that additional contracts are pending.

IRON SITUATION.

The settlement of the lake ship builders' strike is expected to hasten the placing of specifications against existing contracts for plates for new vessels. A considerable tonnage remains to the credit on contract of some of the ship builders, the labor trouble having prevented them from taking out as large quantities of material for current needs as they had expected. While new business in pig iron and finished lines is very light, there is no sign of genuine weakness, and conditions seem somewhat stronger than are usually expected at this time of the year. In the east the pig iron market is holding its strength with moderate buying of lower grade irons. The Bessemer association has sold 1,500 tons of Bessemer pig iron for fourth quarter delivery at $23 valley furnace, the lowest price quoted since the heavy sales made at $21 in April. Merchant and boiler tube business is especially active. June structural business was in lighter volume than the previous month. The iron and steel bar market remains sound, a sale of 35,000 tons of steel bars to an interest not agricultural having been made during the week.

PERSONAL.

Oscar Winter, who for more than six years has been steam and engine expert of the National Tube Co., formerly the Lorain Steel Co., of Lorain, has severed his connection with that company and opened a consulting office in the Rockefeller building, Cleveland, where he will give special attention to expert work in steam engineering. Mr. Winter's experience covers a very broad area, and prior to his connection with the Lorain Steel Co. he held the position as chief engineer of the New York Edison Co. for a number of years. He is a well-known marine engineer, having spent 14 years in the Atlantic service, where he has served as chief engineer of the finest American ships afloat.

The Toledo Ship Building Co., Toledo, O., did a smart bit of work in repairing the steamer Australia which was sunk in collision with the steamer Bethlehem in St. Clair river. The Australia was placed in dry dock June 21, was floated on June 29, and sailed July 1. Considering the extensive repairs that were necessary, this is very quick work indeed.

The steamer Smith Thompson, which was launched at Toledo June 29 will be ready to go into commission July 18.

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"IN THE MERCHANT SERVICE"

Graham and Jones, assistant engineers on the mail steamer Granville, were passing their time off watch in the manner each thought best. Graham sat up on his bunk, his feet gracefully dangling about the head of Jones, idly watching the efforts of that individual striving hard to color a near-meerchaum pipe. The pipe, in response to the generous outlay of about 10 lbs. of tobacco, had already assumed a jaundiced yellow hue, "proof," Jones said, ignoring the sneers of his room-mate, "that the meerchaum was the genuine goods."

The clatter of many voices at the engine room door at this moment caused Graham to suddenly swing his legs back into the bunk, draw the curtains, and, as he closed his eyes, say, "More passengers to see the machinery and all that pertains thereto—Mr. Jones to show them around."

Jones glared wrathfully at the drawn curtains of Graham's bunk, and turned to see the chief engineer's boy at the cabin door. "The chief engineer would like one of you gentlemen to come to his room, there are some passengers waiting to go below," said the boy. Jones glanced reproachfully at the rigid form of his room-mate. "All right," he snarled, as he reached for his coat, "blessed if I don't sign on for a Cook's touring guide."

The babel of voices gradually died away as the passengers descended the engine room, the martyred Jones, with a hypocritical smirk, advising the gentlemen to see that the ladies negotiated the ladders "stern foremost." "Tell 'em to face the ladder," he explained, "and keep their skirts tucked well in." Strange to say, the dying away of the voices was the signal for a general resurrection along the quarters, the wily Graham descending from his berth to join the boys in the third's room.

"I'd sooner do a couple of hours hard graft in the boiler rooms," one of the juniors was saying, "than take a party of squawking females down the engine room. Last trip I convoyed two of them as far as the middle grating, when the younger of them decided that she had gone as far as it was safe, and we had to return. The older one grabbed her skirts and stepped high, like a hen on a muddy road, and the engine room as clean as a—well, as clean as it usually is when the hysterical sex comes a-visiting. But the limit was reached when the younger, a fluffy blonde, borrowed a handkerchief from me to tie over her head and decided to retain it as a souvenir of her trip. "A silk handkerchief, too," he added, "which finishes the Sir-Walter-Raleigh act so far as I am concerned."

"It wouldn't do to have the nerve Pearson showed one sailing morning," said Graham, reaching for one of the third's cigars (the third not being around). "You see, Pearson had been on watch, and, as is usual on the lighting-up watch, on his feet most of the night. Naturally, when relieved at day break, he turned in for a good long sleep. Around 10 o'clock some of these rubber-neck passengers, who make a point of seeing through a ship before their baggage is properly stowed, came along and wanted to see the machinery. The 'Old Man' was busy, but told his boy to call Pearson. Of course he had forgotten that Pearson was on watch all the previous night, but Pearson, always obliging, clambered from his bunk and got into some clothes. He found the passengers waiting on the 'tops' and silently beckoned them to follow him down the ladder. On reaching the platform he turned and faced the starboard engines, the passengers at his side. 'This is one set,' he said, and, turning on his heel to face the port engines, 'this is the other set.' Crossing the engine room he started up the other ladder, the passengers still following in the rear, and stepped out on the other deck. 'Well, she's a fine job, ain't she?' he asked as he nodded farewell and started for his room and bed."

"That is just like old Pearson," said the junior, "but the funniest incident I ever witnessed happened on one ship I was on. The Second brought a little sad-faced man down to see the boiler rooms one afternoon. After peering into the bunkers, dodging swinging slice bars, stumbling over the small coal as passengers will, the little man said he wondered how people could exist in such a place, and started for the engine room door. A burly coal-passer sidled up to the pair and said:

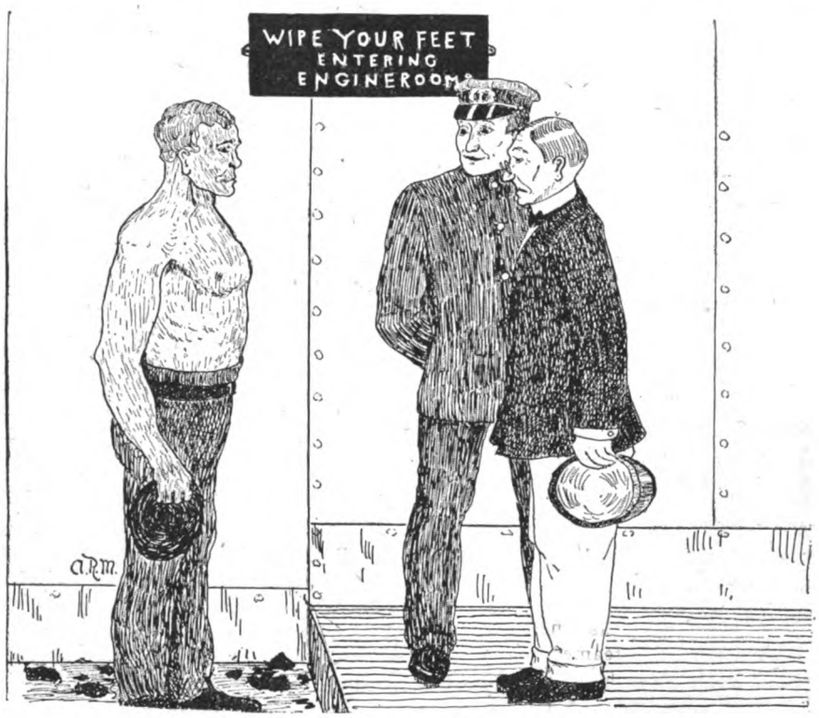
"'Mr. Gillies, ain't there something you've fergot to show the gen'leman'?

"'Not that I know of,' answered Gillies, suspecting some game, 'why'?

"'Ain't you fergot to show the place the coal-passer dropped dead'. persisted the man.

"'Goodness gracious, men,' said the little man, horrified, 'dropped dead'?

"'Yes, sir, pegged out right where I'm a-standing now.'



"WHAT KILLED THE POOR FELLOW?" ASKED THE PASSENGER.

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"'What killed the poor fellow'? asked the passenger, sympathetically.

"'Well, you see, sir, this coal-passer was just such another pore hardworkin' feller as me, slavin' down here in the heat to get the old ship along. One particularly hot day (just like this 'un) a passenger comes down to the boiler rooms (just like you are doin') an' sees us hard at it. Poor Murphy, with his skin bakin' an' his throat crackin' with thirst, thinks he sees the price of a drink an works harder than ever. Would you believe it, mister, that passenger never opened up a cent's worth. Pore Murphy grabs kind o' wild-like at the water-tap, water bein' no good fer us this time o' year, and curls right up on the coals—stiff.'

"Gillies looked away, for he knew that the crackling sound he heard was a dollar bill changing hands. The time-honored custom of a passenger paying his footing was transpiring, and the hearts of the men were glad within them."

THE "STAND-BY" MAN.

CURRIE'S RELIGION.

BY JAMES ROSSAN.

As Dan Currie, the big, swarthy engineer, stepped into the engineroom of the Magnolia he cast a critical eye over the outfit, and then he swore softly to himself. For years Dan had drove them from the foothills of Minnesota to the Gulf of St. Lawrence, both the good and bad ones. But here his experienced eye told him that he was up against a tough proposition.

The Magnolia was one of the old, obsolete wooden steamers of the lakes, with engines best described as an "animated scrap heap" and boilers known as "relics of barbarism." And this was what Currie had bargained to keep moving at her ten mile clip. The owner had lectured him long and eloquently on the ship's pitifully small earning capacity, and had finally limited him to a ridiculously small expense account per trip. Yet, the former incumbent of the position, an incompetent, had been discharged for cause; and Dan had many mouths to feed at home. He had his faults, or he would not have had to take the Magnolia, but no man dared breathe a word against his qualifications as an engineer.

The young second engineer, who was in charge, immediately informed Currie that she was a tartar. "She's out of line," he said, "and the journals wobble around like a chip in a gale. The crankpins are smoking most of the time and the pistons are leaking so bad that the men can not steam her."

"Is that all?" Currie answered sarcastically. "How is the rest of the stuff? The deck pump for instance."

"Oh, that hasn't worked for a long time," was the reply. "We have no packing for it. But they never rinse decks here anyhow, so we have no use for it."

"And the bilge pump?" Currie inquired farther.

"That has no strainer, and consequently the suction pipes are plugged. We blow the bilges clear once an hour with the syphon. You see we have no time to monkey with that small trash, it keeps us busy to attend to the big things."

In a hurried examination Currie found that the feed pump, through the agency of sundry leaky valves, received a plentiful supply of cold water from the seacock and delivered it direct to the boiler without passing it through the heater. Next the "second" informed him that the former "chief" had said, it would be impossible to keep the Magnolia on her time without refitting the main bearings, renewing the piston rings, and installing a fan or blower in order to increase the draft. Imagine then the shock that "second" received when the new "chief" put him and his crew to work grinding valves and renewing leaky joints. But the climax was reached when Currie returned from the store, after spendng his full trip's allowance, with a new set of strainers for the bilge pump-suctions and packing for the deck pump. It was then the "second" offered to lay a wager with the oiler that the new chief would not bring the Magnolia back.

Presently the old wheezy hoists finished the unloading and the Magnolia started to bump her way to the head of the lakes. The first men to receive a surprise from the effect of the new "chief" were the firemen. With the feed water entering the boilers nearly the temperature of the steam, they found it quite easy to hold the steam gage on the spot. As they had been accustomed to see it drop forty pounds in spite of their best efforts, this put new courage into the men and they worked with redoubled zeal. But there were other surprises to come.

With the steam pressure held steady and sundry changes in the cut-off a place was finally found where the old engine balanced fairly well and ran comparatively smooth. The wobbly shafting steadied itself up and the hose was dispensed with on the crank pins and they showed no excessive heat. The "second" allowed that he would never have believed that the old scrap heap could run as quiet as she was doing; and he was ready to swear that Currie was a master of the black art.

Thus the journey of the Magnolia was converted from a voyage of driving, and cursing, and hitting, into a regular pleasure jaunt; but there were other things to come.

A careless sailor upset a lamp in the forepeak and started a bale of oakum on fire. A strong draft through a ventilator quickly fanned it into a respectable blaze. There was no such thing as a fire alarm system in vogue on the Magnolia, yet they had something nearly as effective. A watchman, half scared to death, came aft on the double quick and shouting at the top of his voice. And thirty seconds later a surprised skipper up forward saw a hose, which had laid dead and useless for weeks, swell, and snout, and pump like a thing of life. In order to protect himself from the murderous assault it was making on him the skipper had to pick it up and turn it onto the fire. And thirty seconds later that poor blaze was knocked galley west into a cocked hat. So much for the deck pump and the new packing.

It was not until Lake Superior was reached that the bilge pump received its tryout. A moderate gale came from the northwest, and the old Magnolia, loaded far beyond a safe limit, began laboring heavy. The captain was steering straight for a safe harbor far ahead. He knew the Magnolia's habit of making water rapidly when laboring in a seaway. When nearing the harbor the overworked sounding rod showed an increase in the bilges. Then came the snow, fast and furiously it was driven obscuring the vision to a few feet.

The captain went to the engineroom. "It will be taking a desperate chance," he said. "But I suppose I will have to get her in?"

"Why?" said Currie.

"The water," the captain answered. "It is gaining rapidly. Is the syphon going continuously?"

"Why, no," said Currie. "We haven't even started it yet."

"Good God, man!" the surprised skipper ejaculated, "What's keeping her clear?"

"The bilge pump," Currie answered, in a matter-of-fact tone.

"The bilge pump!" the captain repeated. "Why I never knew we had such a thing aboard. Possibly then we can keep her clear with both syphon and bilge pump going?"

"We certainly can," the engineer answered. And a happy, contented skipper went forward and squared his ship away, and let her drive before the gale straight for her destination. Next he sat down in the snug shelter of his

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cabin and silently thanked his God that he did not have to attempt the narrow harbor entrance on such a dirty night. While down below the faithful bilge pump and the noisy siphon labored away holding the water in check until the gale abated. And the good ship Magnolia reached her destination on time with bilges dry and decks rinsed clean.

After placing his ship at her dock the skipper sat down and wrote a letter to the owner, the burden of which ran as follows:

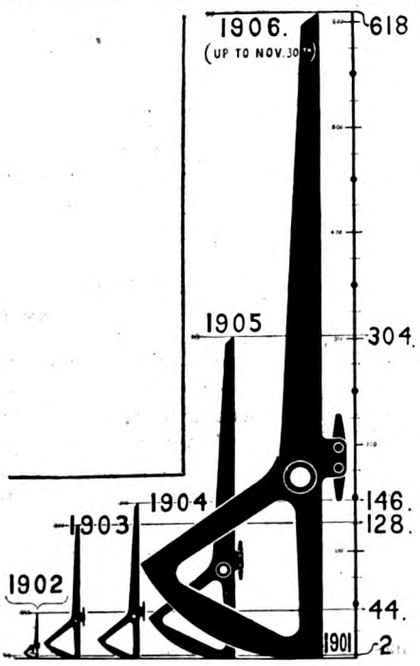
"Had a pretty tough voyage. Caught on fire on Lake Erie and bucked out a gale on Lake Superior. But, after all, it is not such a difficult task to navigate one of these boats providing a man has an engineer who knows his business."

Down below Currie was delivering a lecture to the young second engineer.

"My son," he said, "you are still young and have a great deal to learn. Let me give you a little advice, and mark well my words. In all my time of driving them up and down these lakes it has always been my religion to take the most scrupulous care of the little things. And I have found that then, somehow, the big things will take care of themselves."

WELIN QUADRANT DAVIT.

For years attempts have been made to improve on the old form of boat davit which has been continued in use since man first sailed the seas in high freeboard ships, and, until the invention of the Welin quadrant davit, no life boat launching equipment had been recognized as an improvement over the old style.



SHOWING YEARLY INCREASE OF INSTALLATIONS.

There is no better evidence of the merits of a device than its ready acceptance by those for whom it is designed. To better illustrate the increasing popularity of the Welin davit the diagram herewith showing the yearly increase of installations has been prepared.

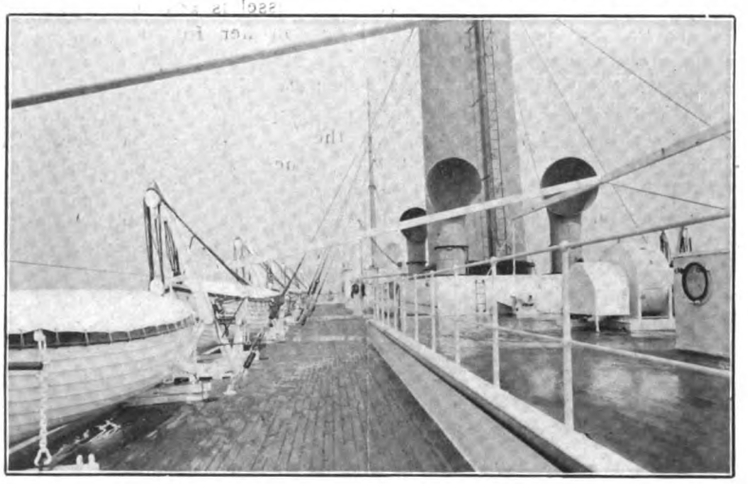
At the present time over 1,500 are in use or ordered for equipment on ships plying in every quarter of the globe. The Allan line has installed them on their new steamers Victorian, Virginian, Crampian and Corsican. The Royal Mail Steam Packet Co. has complete installations on their 10,000-ton steamships Aragon and Amazon and are fitting out two more 10,000-ton liners with them. The North German Lloyd has equipped twelve of their new ships with the Welin davit. The Toyo Kishen Kabushiki Kaisha, the French line, Hamburg-American, Holland-American, the Lloyd Brazilliero and other lines too numerous to mention are equipping new and old vessels with this apparatus.

It is interesting to note that such concerns as the Midland Railway Co. and Great Central Railway Co., of England, the Entre Rios Railway, of South America and the company operating the ferry lines between San Francisco and Oakland have equipped their ferry boats with the Welin davit. This indicates that this equipment is suitable for all vessels with light superstructure decks such as lake vessels, ferry and river steamers, etc.

The catalog issued by the American manager, A. P. Lundin, 17 Battery place, New York, is a handsome one. It will pay any interested superintendent or ship master to write for it.

AT HEAD OF THE LAKES.

Duluth, July 1.—The predictions of record breaking shipments in June from the Minnesota mines have been borne out by compiled figures. This year 969,513 tons more were shipped from three ports at the head of the lakes than in June, 1906. Of this increase the Missabe docks were responsible for 499,385 tons or more than half and the Superior docks did over 37 per cent better than a year ago. The total shipment for the month was 4,677,139 tons. For next month the prospect is for a much bigger output as the remodeled dock No. 1 at Allouez was last week completed and the No. 5 dock at Two Harbors which was rebuilt this spring was put in service at 5 o'clock on Friday last. These two docks should make new records for themselves in July.



STEAMER AMAZON OF THE ROYAL MAIL PACKET CO.

The shipments by docks during the month were as follows: Duluth, 2,156,216 tons as compared with 1,656,831 tons in June, 1906, Two Harbors, 1,303,195 tons, against 1,165,207 tons a year ago and Superior 1,217,728 tons against 885,588 tons. From the Marquette range the shipments give promise of being less than last year particularly through Marquette while the Menominee range will do close to a quarter of a million tons better.

At Two Harbors the new No. 6 dock soon to be built will inaugurate the use of steel in the construction of the superstructure and concrete for the abutments. The superstructure will be built of I-beams, angles and channels but the pockets will be lined with wood. The footings for the steel uprights will be of concrete resting on the usual cribbing. The new dock will be located west of No. 5, will be 940 ft. long and contain 142 pockets. It will not be ready for service this season.

While in the ore trade the past week

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at Duluth was one of the biggest ever experienced the grain trade remained seasonably dull though with the exception of wheat shipments better than the previous week. The figures for the week are as follows:

JUNE RECEIPTS.

	1907.	1906.
Wheat	1,749,627	982,845
Corn	26,357	57,439
Oats	160,841	589,005
Rye	13,647	8,268
Barley	180,975	126,467
Flax	565,115	690,515
Total	2,696,562	2,454,539

JUNE SHIPMENTS.

Wheat	3,004,728	1,583,890
Corn	1,194	686
Oats	809,763	2,310,280
Rye	1,549	31,096
Barley	374,379	113,146
Flax	1,131,566	1,128,301
Total	5,323,379	5,167,399

During the month this year a better record was made however than last year both in receipts and shipments and the average movement of grain each month since the first of the year has been higher than ordinarily. The stocks of the coarse grains, corn, oats, rye and barley at Duluth are very low but there is about 5,000,000 bushels of wheat stored here and about 3,000,000 bushels of flax. The comparison of this last June with June a year ago in the matter of receipts and shipments is as follows:

WEEK ENDING JUNE 29.

	Receipts.	Shipments.
Wheat	428,531	397,481
Corn	18,198	.....
Oats	38,478	107,161
Rye	7,359	832
Barley	79,410	171,790
Flax	135,140	283,611

The rate on grain from Duluth remains steadily at 1⅞ cents and from Fort William it is quoted at 2¼ cents.

The coal handlers at this port and the railroads hauling coal to the northwest have not been altogether successful in getting interior retail dealers to purchase their requirements early. Every effort has been made but with the continued large quantities of coal coming up the lakes, the movement of coal to the interior is slow enough to give promise of a possible crowding of the docks.

This season is one of the heaviest shipping years Ashland has had for some time particularly in the matter of coal receipts. An interesting circumstance has been the loading of the J. P. Morgan for three consecutive Sundays at that port not only because of the regularity but as indicating the time required to make the round trip from Ashland. One of the Morgan's cargoes went to Chicago and the other to Fairport so that the time required is shown to be just a week to either port.

The launching of the new steamer Ward Ames building at the Superior ship yard has been set for July 27.

QUESTIONS FOR WHEELSMEN AND WATCHMEN.

SEVENTH INSTALLMENT.

73. How must the wind bear to those on board when a sailing vessel blows two blasts of her fog horn?

74. If the wind is east and a sailing vessel heads NE x N, what tack it she on?

75. If the wind is SE and a sailing vessel is steering SSW, what signal on her fog horn would she be required to make in case of thick weather?

76. If a vessel is heading NE with the wind N x W, which is the weather side of the vessel, the port or starboard side?

77. You are bound up Lake Huron with the wind NW, is the west shore a lee shore or a weather shore?

78. What does the master mean when he says "starboard" to you?

79. Does a red light give way to a green light, or a green light to a red light?

80. What is meant by the term "headway"?

81. What is meant by the term "sternway"?

82. What is meant by the term "steerage way"?

83. What is meant by "hard-a-starboard"?

84. The point on the compass card that is exactly against the lubber mark of your compass is N x E ½ E, how is your ship heading by this same compass?

ANSWERS TO QUESTIONS FOR WHEELSMEN AND WATCHMEN.

FOURTH INSTALLMENT, PUBLISHED JUNE 13.

37. The red and green side lights when underway; green on the starboard side and red on the port side.

38. Ten points — from straight ahead to two points abaft the beam.

39. The green light on the starboard side and the red light on the port side. On a sailing craft they must be placed well forward where the sails and booms cannot shut them out. In steam vessels they can be either placed forward or pretty well aft. They are usually placed forward. Sidelights are always placed inside of a screen, and this screen must project at least three feet forward of the light. This is to prevent these lights from being seen across the bows, that is, the green light from being seen from the port side and the red light from the starboard side.

40. A white light exhibited when a vessel is lying at anchor, moored to a wharf or when aground in or near a channel or fairway. An anchor light is visible all around the horizon. Consult Rule 9 of Pilot Rules, also (e) of Rule 3.

41. Three distinct blasts of her whistle at intervals of not more than one minute, but as much oftener as may be deemed necessary.

42. Consult (b) of Rule 14.

43. Consult (d) of Rule 14.

44. Two blasts of her fog horn at intervals of not more than one minute.

45. Fog, mist, falling snow, heavy rainstorms, etc.

46. About SE x S.

47. At least two miles.

48. Go at moderate speed; keep an extra good lookout; sound the fog signal at regular intervals, and when hearing apparently not more than four points from right ahead, the fog signal of another vessel, reduce speed to bare steerageway, and navigate with the greatest of caution. When in the vicinity of land or in making the land or a harbor, use your lead. No matter how sure you may be of your position use your lead. The lead should always be used as a check. When you once get in the habit of using the lead you will have great confidence in it, and you will learn to use it intelligently. Always compare your soundings with those given on the chart for the place you are in.

The Austrian minister of commerce has recently again taken up the discussion of the need of new harbor works at the port of Trieste. The port has been visited by a board of experts for the object of studying the subject and conferring with the municipal and maritime authorities as to the nature and extent of the improvements to be undertaken. Certain new harbor works are at present being pushed to completion and it is believed that the projects now in view will not be allowed to drop although the plans are beset with many difficulties, owing to the fact that many conflicting commercial interests are at stake.

Capt. W. P. Potter, U. S. N., who has been assigned to the command of the new 16,000-ton battleship Vermont, at present lying at the Charlestown navy yard, joined the vessel on June 3. The Vermont will not be completely finished and outfitted until after Old Home week in July.

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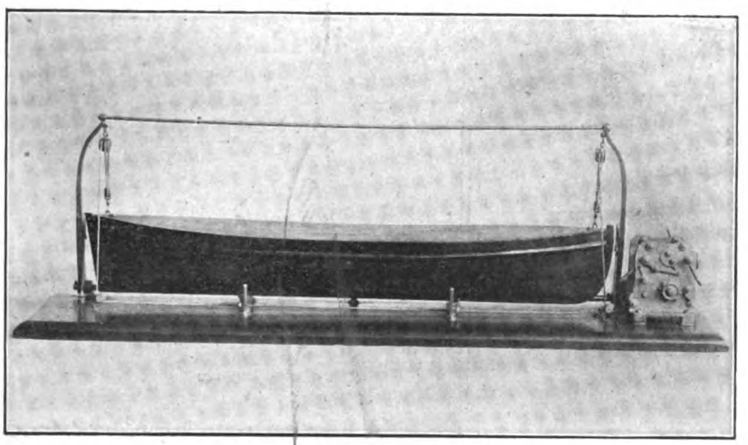
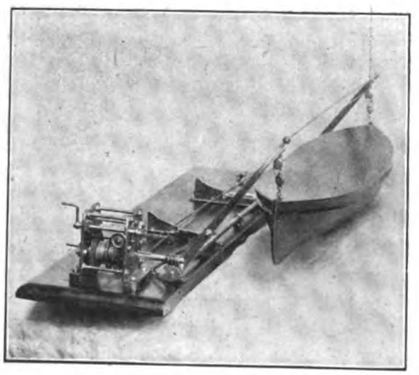
LIFE BOAT LOWERING AND HOISTING MACHINES.

The accompanying photographs of a life boat lowering and hoisting apparatus, the invention of John Boag, of Kearny avenue, Kearney, N. J., will be of interest to those especially interested in such apparatus. In the views will be seen all the apparatus pertaining to the invention, the object being to provide an improved means of handling life boats, simple in construction and operation, a further object being to provide an apparatus which may be operated by hand or mechanical means. The following is a description of this device:



INBOARD VIEW OF BOAT ON DAVITS.

To the deck of the vessel is secured, on any suitable foundation, transversely-arranged brackets in which is mounted a longitudinally-arranged davit shaft provided with a worm gear. Arranged transversely of the shaft is a power shaft provided with a worm fitting said worm gear. Rigidly connected with the longitudinal shaft, at the ends, are the boat davits, the overhang of the davits being controlled by links fixed to the deck of the vessel. These links assist, also, in supporting the weight of the boat when swung out.



BOAT SWUNG OUT READY TO LOWER.

Placed inwardly of the davit shaft is the mechanism which operates the power shaft and the ropes supporting the boat when raising or lowering. In brief, this mechanism consists of a winch controlling the worm gear and having a drum divided into two parts, said drum being so arranged as to wind or unwind the ropes and falls connected with the life boats. A clutch gear frees this drum when the weight of the boat is off the cradle and davits swung out all ready for lowering, the lowering of the boat being controlled by a brake band operated by a hand wheel.

When the boat rests on the cradle the davits have a slight overhang inboard, the arrangement being that the outward movement of the davits raises the boat from the cradle. The outboard part of the cradle is weighted to fall over when the boat rises, leaving the boat free to swing out. It is the claim of the inventor that one man can raise the boat from the cradle and control the lowering apparatus, two men being required to hoist the boat from floating position to the deck. There is nothing in this gear to get out of order, and, with proper attention, no repairs should be necessary.

NOTES FROM NEPTUNE.

More than 50 fine vessels are always at work looking after the various submarine cables of the world.

Last year a new record sounding was taken in the northern Pacific. It was 5,269 fathoms, or only 66 ft. less than six statute miles. This abyss is called the Nero Deep.

Dr. De Forest, of the De Forest Wireless Co., it is said, believes that the day is not far distant when ships equipped with wireless telephony will outnumber those equipped with wireless telegraphy.

Twenty-one thousand bottles of beer, 6,000 bottles of wine, and 2,800 bottles of spirits, formed the very considerable refreshment consumed on the new White Star liner Adriatic on her maiden voyage.

A royal commission has been appointed, with Prince Henry, of the Netherlands, as president, to inquire into the prevention of loss of life by shipwreck, and generally to study methods of saving life at sea.

The Marine Engineers' Beneficial Association and the United Harbormasters and Pilots have been successful in their application to have the working hours of crews on tug boats limited to 13 per day.

Ten coal-passers on the Hamburg-American liner Amerika will be charged with insubordination on arrival at the home port. The ship's officers complained to the recorder at New York that the men were afflicted with "general cussedness."

Nineteen turtles, part of the cargo of the steamer Bradford, Port Antonio to New York, fought amongst themselves during a "hose-down" at sea. An officer was bitten while assisting the crew to straighten out the combatants. One turtle perished in the melee, and, to prevent its being wasted, was served up as soup to the crew, much against their will, no doubt.

The master of the British steamer Cowrie, from Balek Pappan, Borneo, must have breathed a sigh of relief when he unloaded the last of his cargo at Philadelphia. Forbidden the passage of the Suez canal, therefore compelled to round the Cape of Good Hope, and hurried from each port of call, he finished the long voyage without anything in the way of a calamity. The cargo was a little matter of 6,000 tons of naphtha.

HARBOR HAPPENINGS.

That tobacco is a necessity is the ruling of the Comptroller of the Treasury. Laborers held in quarantine at Colon demanded a supply of the weed, the Comptroller ruling that the expenditure of money for that purpose was a proper and lawful proceeding.

Four firemen and one sailor working overtime on a steamer at Glasgow were placed under arrest. They were discovered, by the officer and engineer on night watch, hoisting a barrel of whiskey aboard with a winch. They had intended broaching the barrel, part of the cargo, for their own private needs.

The crew of the Italian warship Etruria rendered such valuable assist-

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ance in fighting a fire at a lumber yard on the Delaware river front, that the mayor of Camden had them lined up while he extended the thanks of the citizens and owner of the plant. The mayor was no Swettenham.

An inventor on the Pacific coast has discovered, it is announced, that a small current of electricity moving through wooden wharfs and other harbor structures will counteract the action of the destructive teredos. Hitherto, in spite of much experimenting, nothing has been found that was at all successful in rendering immune the action of these pests.

That the ban forbidding the production of the opera Mikado in England has been raised "has nothing to do with the case" that the band of the Japanese cruiser Tsukuba, while playing at an entertainment on board to the British naval authorities in Portsmouth harbor, unwittingly, no doubt, played selections from the tabooed opera.

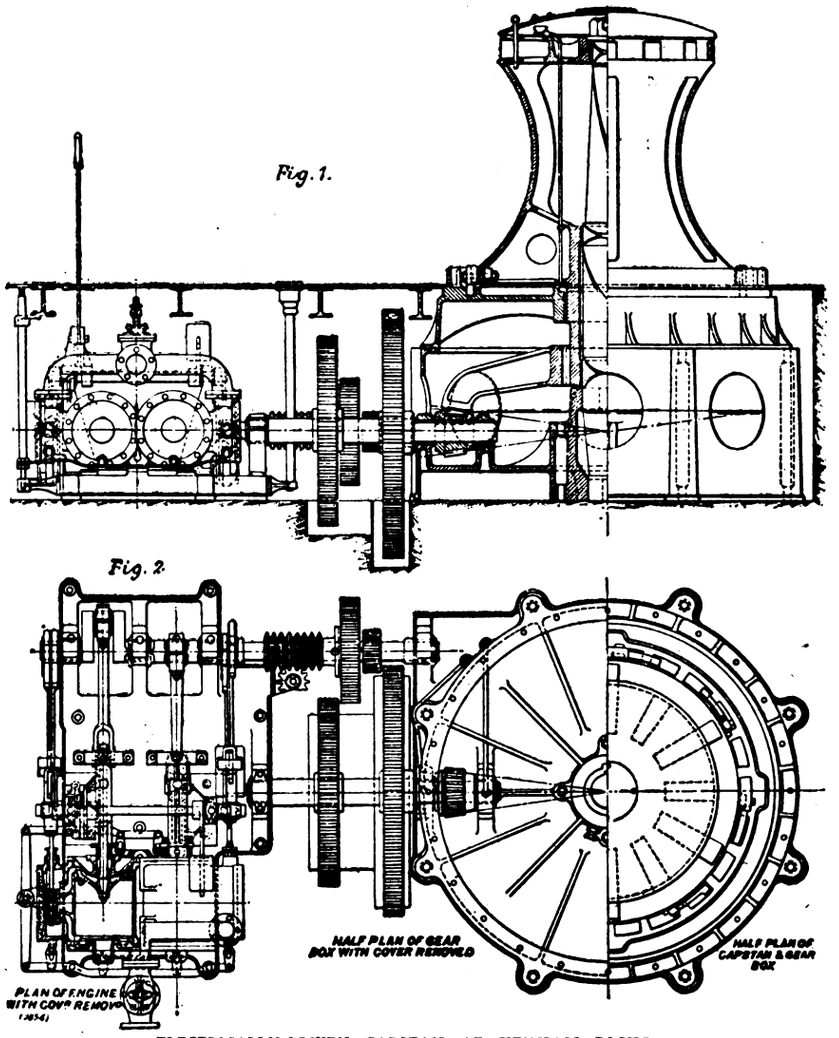
At Liverpool, lately, judgment was given in connection with the board of trade inquiry on the stop-valve explosion aboard the Elder-Dempster liner Ashanti, in which the fourth engineer and three firemen lost their lives. The court found that the casualty and consequent loss of life were due to the breaking of the bridge-piece of the valve caused by the application of external violence for the purpose of tightening same.

A correspondent in the *New York Times,* writing of the lax ferry service, said among other things: "I rapidly discovered that the boats in this service are the discarded ones of Staten Island, and the machinery creaked and howled so that the entire boat vibrated in such a manner that the journey was anything but comfortable, and conversation was rendered impossible." Here is a chance for the lubricant and lubricator people.

AIR-DRIVEN CAPSTANS.

The sectional drawings herewith represent the air-driven capstans and engines constructed by Messrs. Clarke, Chapman & Co., Ltd., of Gateshead-on-Tyne, for the naval docks at Keyham. Of these capstans, forty-one were supplied by the firm, and each was driven by its own compressed-air engine.

The air-engines are of the horizontal two-cylinder type, and drive the warping capstan through spur and bevel gearing, as shown. The gearing is so arranged that the capstan can be driven at two speeds; with the quick speed the strain exerted on the rope is 4 tons at a speed of 120 ft. per minute, and at the slow speed a strain of 16 tons is exerted at a speed of 30 ft. per minute. All the gearing is of cast steel having machine-cut teeth. The engine cylinders are of gun-metal, and are each 12 in. in diameter by 12-in. stroke, and are arranged to deal with the loads mentioned with an air-pressure of 50 lb. per square inch. The piston, piston-rings, slide-valves, and rods are all of gun-metal. The crank-shaft and all working parts are of wrought steel made to the admiralty tests and requirements. The bed-plates and capstan barrel are of cast iron, the barrel being fitted with portable wrought-steel whelps. The barrel runs loose on the spindle, and is driven by a large cast-steel bevel-wheel, which is keyed to the boss of the barrel. The engine and gearing are sunk into a pit, which is covered by rolled girders and chequered plates. The engine is fitted with the Stephenson link-motion reversing gear; the reversing lever is brought up through the flooring-plate, so that the engine can be worked from the top. All the spindles for working gearing-clutch, drain-cocks, and stop-valves are also brought up to the top of this flooring-plate. The flooring-plates are made removable, to allow of easy access to all working parts.—*Engineering.*



ELECTRICALLY-DRIVEN CAPSTAN AT KEYHAM DOCKS.

The Lunkenheimer Co., of Cincinnati, O., has recently put out a little catalog descriptive of their generator valves. These valves are not intended to take the place of the regular inlet valves on engines of the four-cycle type, but on engines of the two-cycle type they take the place of the usual check valve on the crank pin.

Bids for dredging in Duluth-Superior harbor were opened by Major Graham D. Fitch, government engineer, last Saturday. The Duluth-Superior Dredging Co. was the successful bidder with an aggregate bid of $170,250.

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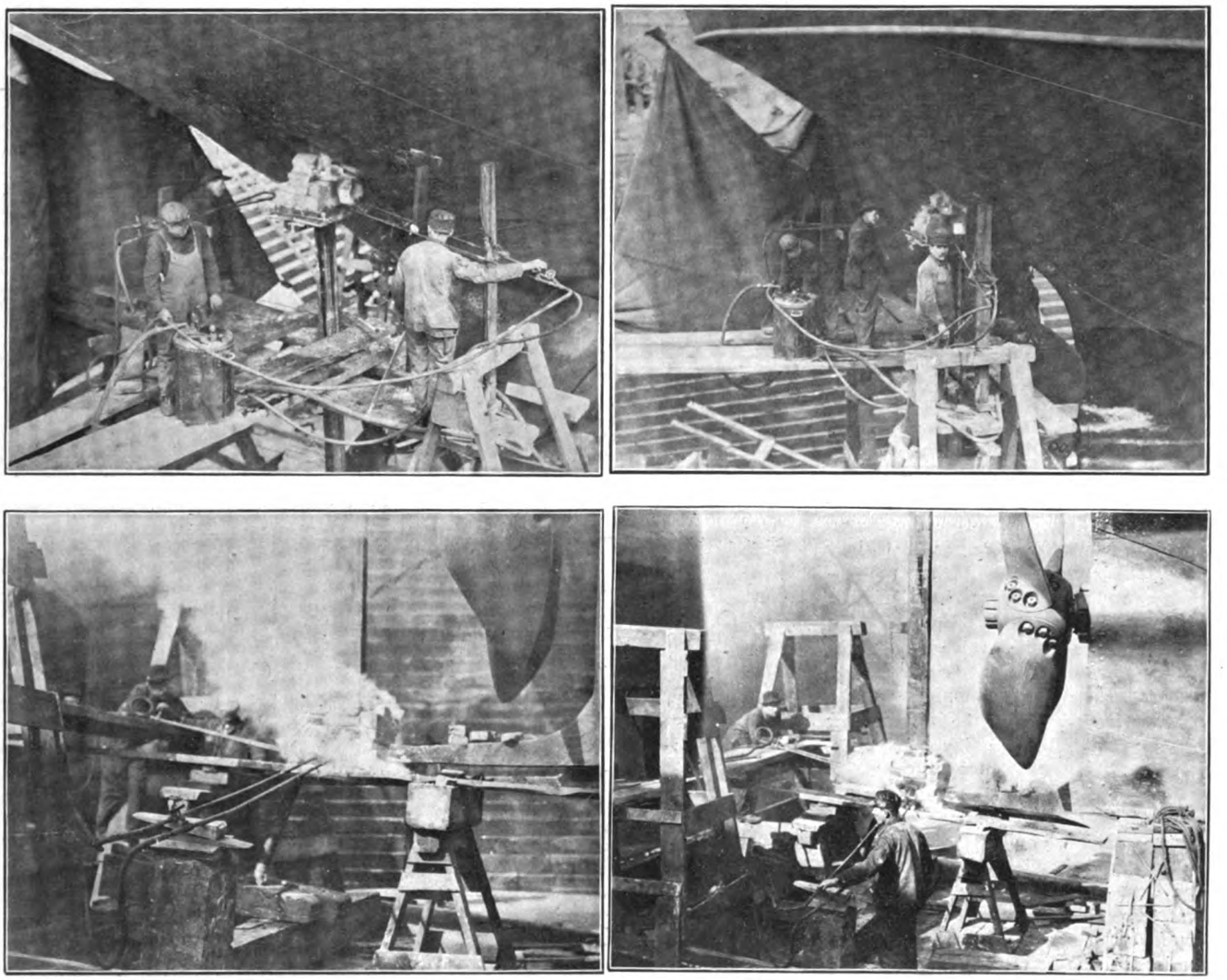
NOVEL WELDING OF RUDDER POST.

Supt. Louis Williams, of the Superior Ship Building Co., devised a rather novel means for welding the rudder post of the steamer Winnebago in dry dock at Superior last week. Capt. Ewart, of the Winnebago, was so taken up with the work that he secured several photographs of the operation. Fuel oil is used for welding frequently, but nearly always in shops where a furnace is built for it. In this case Supt. Williams simply built a temporary brick structure around the splice to be welded and the oil was then applied by a burner made for that purpose, using the air pressure from the dry dock's compressors to spray the oil. In this particular case the back post could not have been welded in any way except with oil, especially at the top of the post, as the splice was only two inches from the shell plate. The plate was not burned or injured in any way and the weld was perfect.



WELDING RUDDER POST OF STEAMER WINNEBAGO.

SELLING THE MARION.

The president has recently approved the plan of the navy department for selling to the highest bidder the United States steamer Marion, now lying at Mare Island, Cal., navy yard. A board of naval officers has valued the Marion at $13.500. When offered for sale one bid only, for $2,500, was received, which could not be accepted as it was below the value fixed. The vessel will be readvertised for sale and the new conditions will permit of the ship being sold to the highest bidder, regardless of the amount. At the same time bids were received for the Keystone and the Lawton, the former being sold to Joseph G. Hintner, of Philadelphia, for $4,200 and the latter to C. W. Jungan for $57,000.

NAMING THE DREADNOUGHTS.

It is likely that the naming of the two new battleships of the Dreadnought class for which contracts are soon to be awarded will be, according to custom, after states. Most of the states have been honored but there remain Delaware, Utah, North Dakota and New York which have no battleships named after them. New York state is eliminated as there is already an armored cruiser named after the city of New York. It is thought likely that Delaware and Utah will be the ones after which the new battleships will be named although after the admission of Oklahoma into the Union there will be another name to draw upon. It is not probable that the effort to induce President Roosevelt to consent to the renaming of the cruiser New York in order to enable one of the new battleships to be named after that state will succeed.

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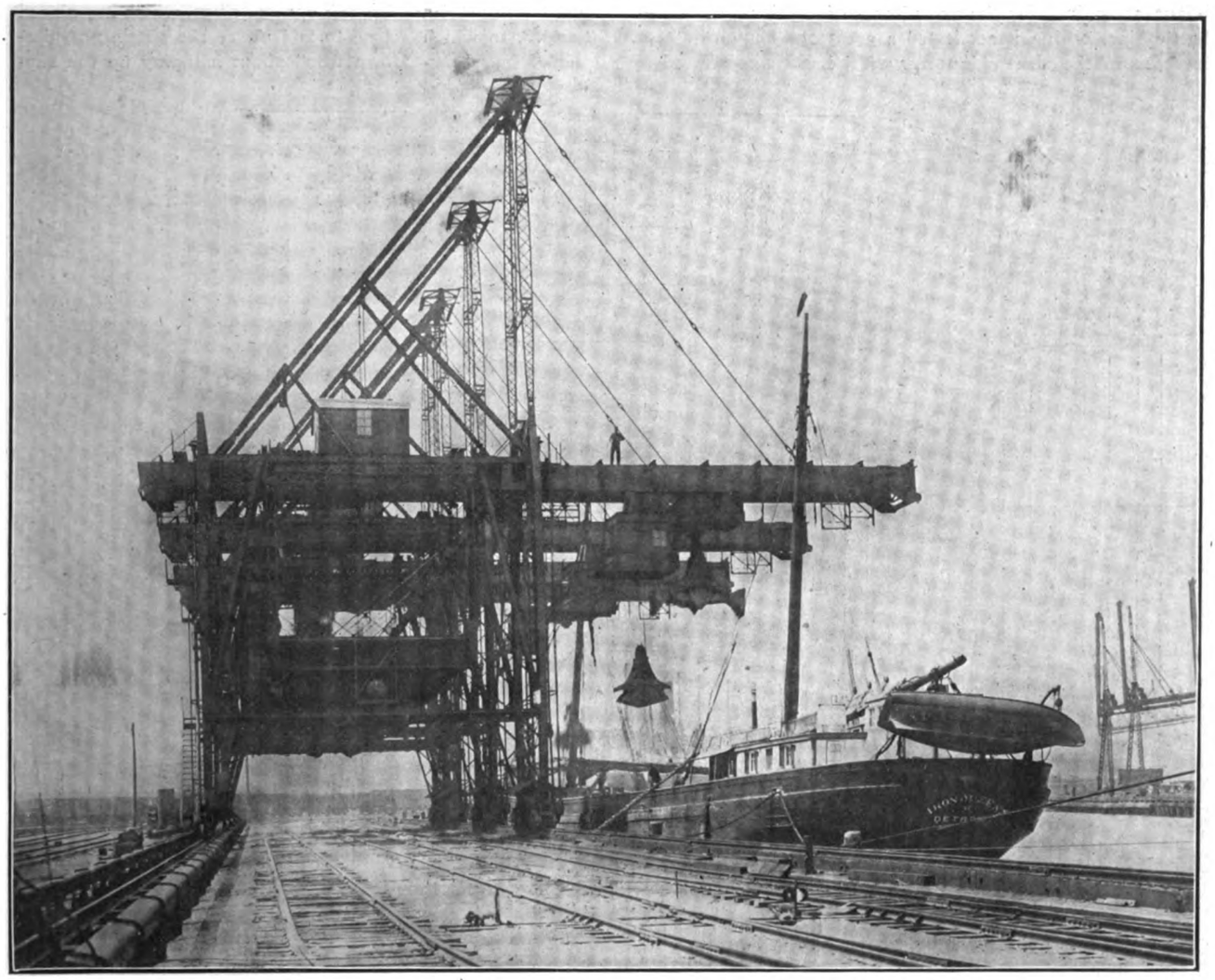
NEW ELECTRIC UNLOADING PLANT AT CLEVELAND.

Equipped with scale hoppers, which weigh out the required burden into the awaiting car, four "Brown Hoist" electric unloading machines have just been erected and placed in operation at the Erie railroad docks, Cleveland, foot of West 25th street, constituting one of the most modern unloading plants now at work in the ore industry of that city. The machines are the first of the new type of Brown electric unloaders to be erected in Cleveland. They were built by the Brown Hoisting Machinery Co., of that city.

The advantages claimed for the scale hopper are numerous. After the ore has been taken up and dumped into the hopper, the load is weighed out into the railroad cars, thus insuring a train of full capacity and removing the need of extensive yards, as practically no switching is necessary before starting the ore train toward its destination. When once the cars are loaded, they are immediately ready to begin their trip to the furnaces.

The new plant takes the place of 15 Brown high-level, unloading and conveying bridges, and will greatly aid dispatch in the handling of the ore. It will be able to receive and discharge from 8,000 to 10,000 tons daily, and it is hoped by the management that a freighter of any size can be divested of its burden in a single day.

The machines are operated by a new and thoroughly modern power plant of 1,050 kilowatts capacity. This station is equipped with three 350-horsepower Stirling water-tube boilers with chain grate stokers; three 525-horsepower cross-compound condensing engines, and three 350-kilowatt Western Electric generators. It will supply the electrical power for the unloaders, the electricity for lighting the dock and for other purposes of the operations. The improved dock is the property of the Erie railroad and is leased and operated by the N. Y., P. & O. Dock Co., with Pickands, Mather & Co., Cleveland, as the manager. W. T. Moore is superintendent of the unloading plant.



NEW "BROWN HOIST" ELECTRIC UNLOADING PLANT OF N. Y., P. & O. DOCK CO., CLEVELAND.

A NEW FUEL.

As soon as the United States geological plant at Norfolk is completed tests of a superior fuel which it is thought will enable any United States war vessel to overtake or outfoot an enemy, will be begun, the plant being erected for that purpose. Government experts hope to demonstrate that this new fuel is not only more efficient than coal but is also smokeless, which is declared to be as big a factor as its efficiency. Tests carried on by the government indicate that a fuel made from slack coal pressed into briquettes burns almost without smoke and also generates more steam and produces more power under the boilers than does the same amount of coal. Briquettes are made by mixing waste or slack coal with tar so that the coal will hold together.

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150-TON HAMMER DERRICKING-CRANE.

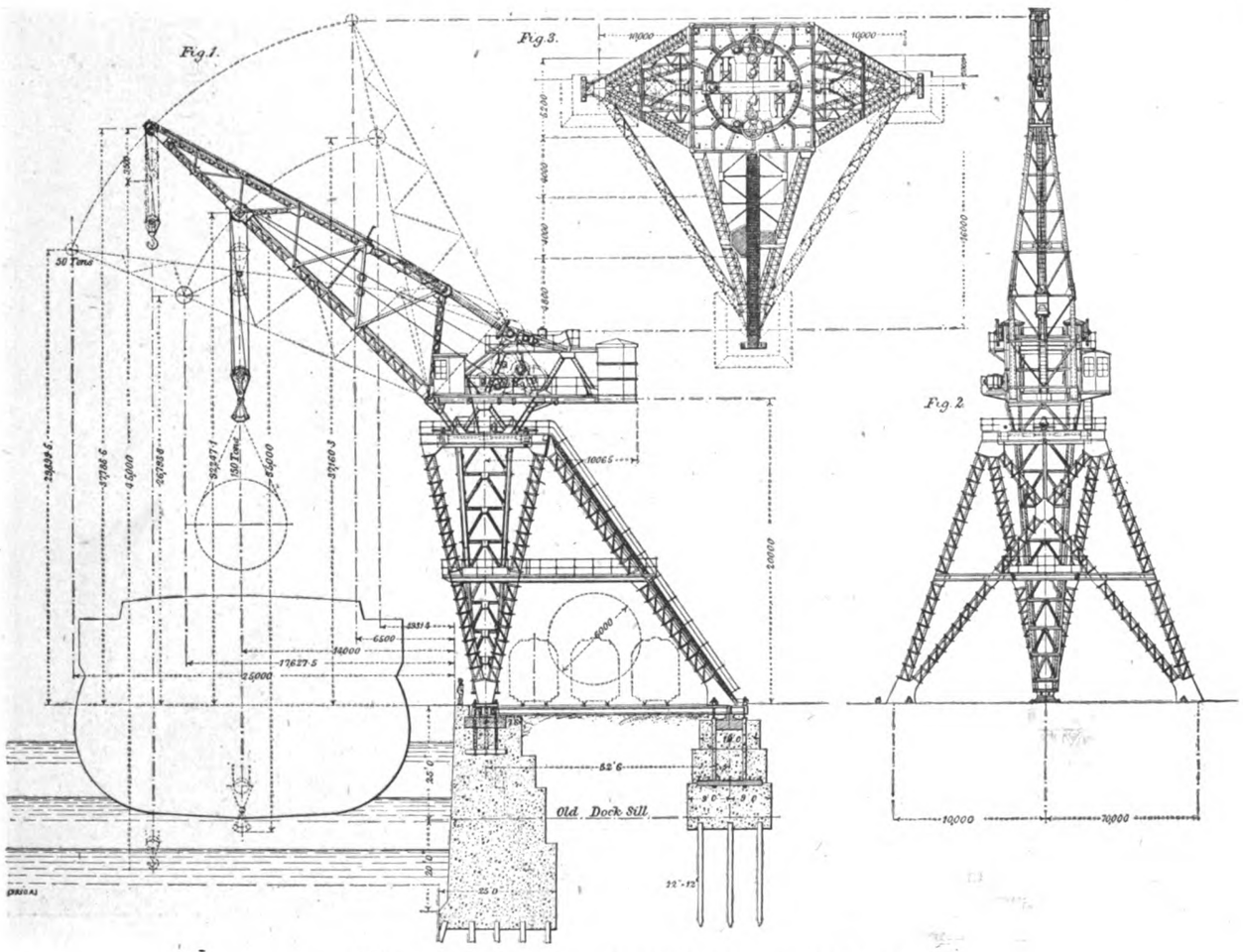
Perhaps one of the chief features that has marked the crane-building industry during the last few years has been the rapid progress made in cranes used for dockyard purposes, the increase in the size of ships, and consequently in their propelling machinery, not to mention guns and such-like appliances required for the armaments of battleships, having necessitated a great increase in the size and power of the lifting machinery used for dockyard work. As a result of the demands made on crane-builders, new forms of cranes have appeared, among them being what is known as the hammer-head crane. This type possessed many advantages over those that had preceded it, but improvements still continue, and now we have a modification of the hammer-head crane in what is known as the derricking hammer-head crane.

Several large cranes of this type have recently been constructed by Messrs. Bechem and Keetman (Duisburger Maschinenbau A. G.), Duisburg, Germany, one of them, capable of lifting 150 tons, having been erected at the yard of the Tranmere Bay Development Co., Birkenhead.

The crane consists of two principal parts. Firstly, the stationary supporting framing; and, secondly, the revolving upper portion, which is enclosed in the supporing structure, and revolves therein round a complete circle. The supporting-frame rests on three feet, which are carried by foundation-blocks, as shown in Figs. 1, 2 and 3, to which it is connected by means of four bracing-anchors in each block. The fourth supporting-block carries the revolving portion of the crane.

The top of the supporting-frame guides the upper part of the revolving pillar, the lower portion of which (shown in Fig. 11) is of a tapering form, and broadens out above the pressure-ring at the top in order to carry in its center part all the driving gear. On the right of this the counter-weight is carried on a short arm, and on the left the foot of the jib is attached. The jib may be raised and lowered in such a way as to command a working field, which is defined by two concentric circles, having radii of about 27 ft. 11 in. and about 88 ft. 8 in. The hook at the end of the jib is designed for loads up to 50 tons, while the hook situated lower down the jib will carry working loads up to 150 tons.

In order to make use of the valuable properties of series-wound motors continuous-current electricity is used as a motive-power. The current is brought through contact-rings, which are placed close to and above the staging of platform fitted about half-way up the support-framing. The driving-gear is all placed in the revolving portion of the crane, as may be seen in the general views, and also in Figs. 4 to 8, which show the arrangement in detail. It is carried on three stages, placed one above the other. The revolving load is entirely carried by the center foundation, and the suspended weight produces a tipping moment which is resolved into two horizontal forces, of which one acts at the foot of the pillar, and the other at the pressure ring at the top of the supporting structure. In order to carry the direct vertical load, a combined spur and bolster bearing,



150-TON HAMMER-HEAD DERRICKING CRANE AT BIRKENHEAD.

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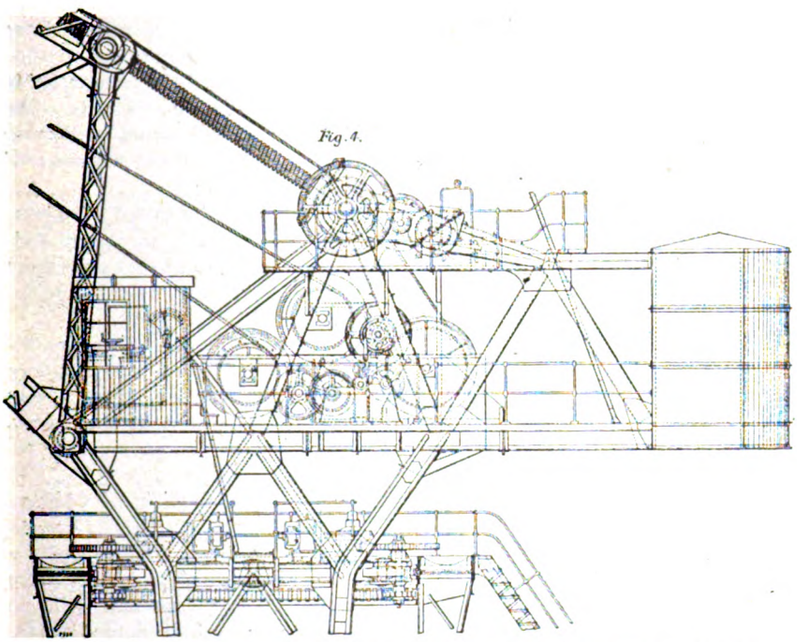
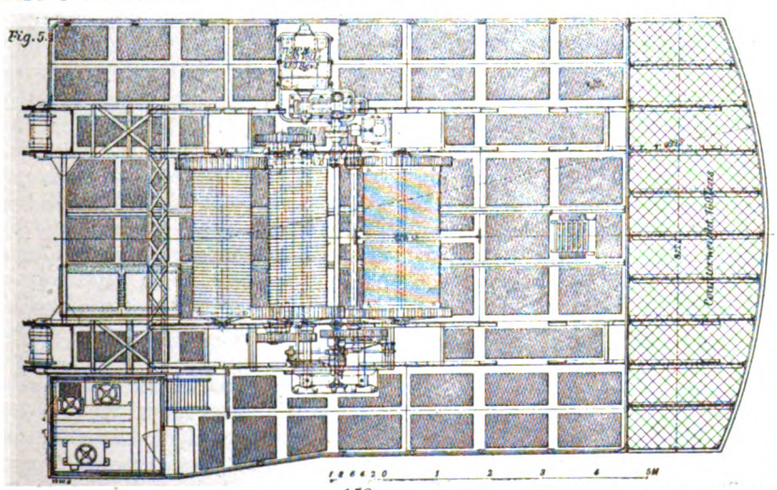
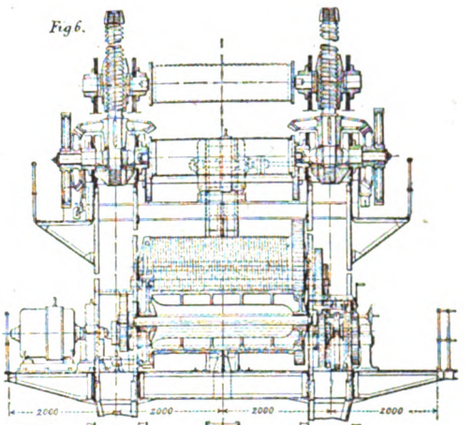
working constantly in oil, is placed in the center foundation. The connection between the pillar and the bearing is such, that, should the foundation settle in a one-sided manner, no detrimental consequences would follow. The bearing is protected against dirt or moisture by means of an oil-box covering. At the upper part of the supporting structure the tipping forces are taken by a roller-anchor bearing, as may be seen in the general views, and in Figs. 4 to 8. From these it will be seen that around the vertical pillar are placed six pressure rollers, which run on a ring-shaped rail fastened to the inside of the pressure ring.

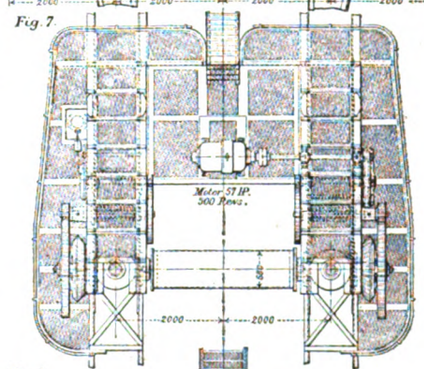
The turning gear consists of two equal driving gears, each driven by a separate motor; these motors work on two worm gears with quick threads, which transmit the movement through pinion to spur-wheels, which act upon the driving-rack fitted to the pressure ring. This driving-rack is made of steel angle-bars, the teeth consisting of turned steel bolts, which, in case of wear, can, without trouble, be replaced by new ones.

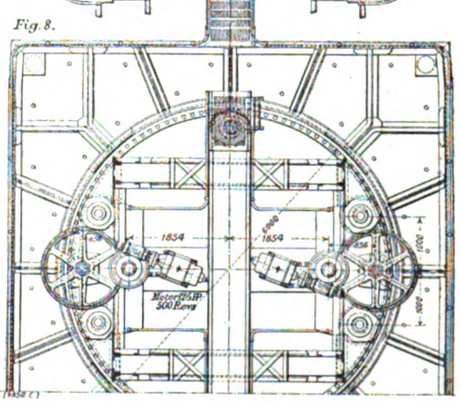
The two lifting-gears are placed on the main platform, and are driven by a motor alternately, the 50-ton lifting gear being placed behind the other. For this load six strands of steel rope are used, of which two are simultaneously wound on two drums of large diameter, placed alongside each other, as shown in Figs. 4 and 5. The lifting-gear for the 150-ton load is placed forward, and has two rope-drums, situated one behind the other. Each of these drums winds up one rope of the 10-rope-ply pulley. The gearing between the drums is actuated entirely by spur-wheels. The coupling of the two winding gears is effected by means of a hand-wheel in a simple manner. In order to hold the load and the driving-gear when uncoupled, powerful band-brakes are provided. The load-hooks revolve easily on ball bearings.











150-TON HAMMER DERRICKING CRANE AT BIRKENHEAD.

Leaving the lifting-gear, we come next to the derricking-gear, which is placed on the top staging. The luffing is performed by means of two heavy steel spindles, which are screwed into nuts of manganese-bronze, fixed to the jib in such a manner that, when the spindles rotate, the jib may thereby be raised or lowered.

The nuts, as well as the ends of the spindles, rest on cross-bearings which pivot round horizontal axes. The two

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spindles are fitted with bevel wheels, which gear with similar ones fitted to a shaft carried at the top of the revolving framework. Motion from the motor is transmitted to this shaft by further gearing, which may be seen in Figs. 4, 6 and 7. The screwed spindles which raise and lower the jib are provided with a counteracting turning movement, and are served by an electro-magnetically-worked band-brake. The control of the crane is effected from the driver's cabin, which is placed on the forward portion of the main platform staging. The outreach of the jib at any time can be read by the crane-man from a dial fitted with a pointer, which is in connection with the jib. Besides the switch apparatus, the driver's cabin is also fitted with a switchboard, with all the necessary safety and measuring apparatus. The metal resistances belonging to the controllers are placed in a secondary cabin.

The crane-framing is constructed in iron latticework, and all cross-sections have been so chosen that they are always easily accessible for painting. The stages are made with perforated plates. Ladders are provided for access to the various stages, and every part of the gearing can be reached without danger or inconvenience. All structural parts have been made of mild steel.

The toothed-wheels, as well as the pressure-rollers, are made of cast steel, the teeth of the wheels being machine-cut where they run at high speed. Forged steel was used for the small pinions, the spindles, shafts, etc., while the material used for the worms was the best tool-steel. The worm-wheels consist of a cast core, round which a bronze ring or collar was shrunk.

The casings used for the rope pulleys are of fine-grained wrought iron.

The ropes are of the best patent cast-steel wire, the active portion of which has a factor of safety of at least 8 against breakage. The diameters of the drums are at least twenty-three times that of the ropes that run on them.

The bearings for the first set of gearing are ring lubricated, and the lubrication throughout the mechanism is well provided for, grease being generally used. The following motors are employed:

Two motors for turning the crane, each 12.5 horsepower, running at 500 revolutions per minute.

One motor for lifting the load, 110 horsepower, at 480 revolutions per minute.

One motor for luffing the jib, 57 horsepower, at 500 revolutions per minute.

With these motors the working speeds are as follows:

Lifting the 150-ton load on the large hook	5	ft. per min.
Lifting the unloaded hook	8¼	"
Lifting the 50-ton load on the small hook	19¾	"
Lifting the unloaded small hook	30¼	"

When revolving the crane makes one complete revolution in from 5 to 7 minutes.

The derricking of the jib from the greatest to the smallest rake, with the suspended load, occupies from 10 to 15 minutes.

As already mentioned, the working speeds when lifting small loads (with a gentle wind blowing) are automatically adjusted to the higher speeds.

The chief advantages claimed for this crane are the following:

1. Having the turning column of the crane placed quite close to the quay wall increases the effective outreach of the crane, which also gives an advantage in so far as the tipping moment is lessened thereby, further advantages accruing therefrom being that anchor-bracing (foundation bracing) tensions in the three foundations points of the supporting framing are reduced to the lowest possible, which results in the neccessity of only small foundation blocks.

2. The supporting-frame of the crane does not obstruct general traffic under the crane on account of its open construction, and admits of three full-gauge railway tracks being made underneath.

3. The three-legged support admits of an exact calculation of the stresses, and particularly admits of the various forces acting on the foundations, and so avoids waste of material in the foundations.

4. Any slight one-sided settlement in the foundations is without detrimental effect.

5. The driving-gears are fixtures on the crane structure, and are arranged in an accessible manner. Great care has been taken to arrange so that a rapid exchange of spare parts can be made in case of wear and tear.

6. The crane is of great efficiency and utility for erecting work, because the jib is very narrow and can easily ply between the masts, funnels, etc., of vessels.

7. The crane is independent of the height of the deck superstructures of vessels, because when the jib is derricked the crane revolves clear.

8. The slightest movements can be made with ease and exactness, particularly when fitting machinery or engine parts, and vertical movements can be executed true to a millitmetre by means of the luffing or derricking gear.

The weight of the constructional steel-work in the crane is 305 tons, and the counterweight weighs 162 tons.

AROUND THE GREAT LAKES.

Muir & Sullivan's dredge working at the mouth of Black river sank last week in 18 ft. of water.

The Leatham & Smith Wrecking Co. has been awarded the contract to remove the sunken steamer Rose from the river at Manitowoc.

The steamer W. B. Kerr now holds the ore and coal cargo records. She loaded 12,558 tons of coal at Lorain for Duluth and took on 400 tons of fuel in addition.

The Hanna Dredging Co., Ogdensburg, N. Y., was the successful bidder to dig a straight channel from Boston to the sea. The amount involved was $3,000,000.00.

The steamer Thomas F. Cole, belonging to the fleet of the Pittsburg Steamship Co., carried 11,639 gross tons of ore to Conneaut last week, the largest single cargo ever delivered at that port.

Capt. James A. Calbick, of Chicago, president of the Lumber Carriers' Association, is dangerously ill.

In the absence of any bids from contractors, the government will do the work on the rubble mound breakwaters to be built at Superior entry, Lake Superior.

The wooden steamer Cartagena, which was recently sold by Capt. James Davidson, of Bay City, to Chesbrough Bros. of Boston, ran ashore at Half Moon Ledges, near Cape Sable, Nova Scotia, July 1. She had undergone extensive repairs at the Davidson yard before leaving for the coast. Reports from Halifax are meager, but indicate that the vessel is broken in two. The crew reached shore safely.

The Canadian steamer Batchawanna was burned off Copper Point on the north shore of Lake Superior last week. The Batchawanna was formerly the propeller Robert A. Packer and was built by Wm. Crosthwaite at Bay City in 1881. She was 290 ft. long, 34 ft. beam and 16 ft. 6 in. deep. The crew succeeded in beaching the steamer at Copper Point but it is expected that she will prove a total loss. She was carrying a cargo of ore to the Algoma Steel Co. at Sault Ste. Marie.

The Cunard Steamship Co., it is stated, is shortly to invite tenders for the construction of two or three steamers of the type of the Carmania.

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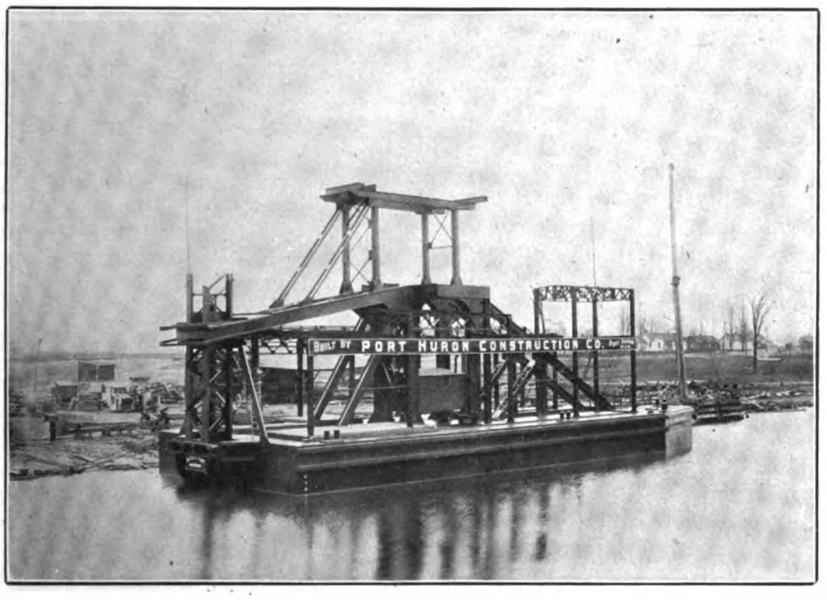
DREDGE HULL ALFRED E. HUNT.

The Port Huron Construction Co., Port Huron, Mich., has just delivered the dredge hull Alfred E. Hunt to the St. Lawrence River Power Co. to be used at Massena, N. Y. This dredge is what is known as a bucket dredge, each bucket holding 12 cu. ft. The hull is built of steel with molded dimensions as follows: Length, 120 ft.; beam, 43 ft.; depth, 11 ft. The main gantry on which will be hinged the inboard end of the bucket arm is 27 ft. above the deck. Above the main gantry stands the trolley gantry whose top is 46 ft. above the deck. This trolley gantry will be used entirely to handle machinery. The stern gantry is built in two sections, the lower section only being shown on the photograph the upper being stowed in the hold for transportation. There is a well 8 ft. wide cut througth the hull extending from the bow aft to midships through which the bucket arm operates. The bucket arm will be raised and lowered by the bow gantry not shown on the photograph but located at the forward end of the vessel. Two large hatches are cut in the after end of the vessel for the reception of the machinery and a special water tight compartment is built for a large hydraulic pump so that in case an accident happens to the pump it would only flood this compartment and not cause any damage to the rest of the hull.



DREDGE ALFRED E. HUNT.

The material dredged after being dumped by the buckets at the top of the main gantry falls on a set of screens, the coarser material passing over the screens and falling into dump scows alongside the hull. These dump scows will then be towed away and the material will be disposed of in the usual manner. The finer material passes through the screens and is carried by chutes to the intake connecting to the suction end of the hydraulic pump which discharges on the land in the usual way. The machinery is being built by the Bucyrus Co., at South Milwaukee, Wis., and will be installed at Massena, N. Y.

TURBINE STEAMERS FOR THE MEDITERRANEAN.

There was launched on Tuesday, May 28, from the works of the Fairfield Ship Building and Engineering Co., Ltd., at Glasgow, the first of two high-speed turbine steamers being built for the Egyptian Mail Steamship Co., and intended to inaugurate, in the late autumn, a new express service between Marseilles and Alexandria, in order to assist the further development of Egypt as a health and tourist resort. Already many of the east-bound ocean steamers take passengers to the land of the Pharoahs, and the P. & O. mail express steamers Isis and Osiris, running between Brindisi and Egypt, have done much to develop this traffic. But the new vessels, with their speed of 21 knots, and with the very splendid accommodation provided must still further influence the favor with which Egypt is regarded as a winter resort. These new ships, named Heliopolis and Cairo, are of great size, equaling the largest of Atlantic liners of a few years ago. Their length over all is 545 ft.; their breadth, 60 ft. 3 in.; and their depth, from keel to shelter deck, 38 ft. The tonnage is 12,000 tons. The machinery, which is of the Parsons turbine type, will develop 18,000 H. P., when three turbines and three propelers are running at 340 revolutions per minute. This is to give the speed of 21 knots already referred to. The hull is divided by water-tight bulkheads into ten compartments, and there are seven decks. As indicative of the provision made for passengers, it may be stated that the dining-saloon occupies the full width of the ship, and is 77 ft. in length. The design is of the Georgian period, and seating accommodation is to be provided for 266 persons, all at small tables. The smoking room is 50 ft. by 40 ft. and will have seats for 107 passengers in nooks, alcoves and corners. It is to be finished in oak in the Queen Anne style. The music-room is 45 ft. by 20 ft., and here the style of decoration is to be of the Louis XVI period. The cafe is 63 ft. by 40 ft. with seating accommodation for eighty-five persons, and will be in the Regency style. There are numerous other public rooms, and these, along with the cabins and other conveniences, promise to signalize the highest excellence achieved in naval architecture.

TARGET PRACTICE.

The compilation of the scores made by the various ships of the navy in the recent target practices reveals the fact that the Pacific station ships have made a remarkable showing. The awards are as follows: Battleship trophy to the Illinois, cruiser trophy to the Boston, gunboat trophy to the Princeton, torpedo boat trophy to the Preble. These awards with the exception of the battleship trophy, go to the Pacific station, the remarkable showing of that contingent being noted in the fact that all of the successful ships there exceeded 85 per cent in the final merit record. No trophy was awarded to any ship of the Asiatic station.

The Republic Belting & Supply Co., of Cleveland are sending out an interesting souvenir in the shape of a calculator for figuring horse power. Engineers and mill-wrights all over the country are writing in for them. They will be sent to anyone interested in power transmission upon application.

Capt. Frederick Tholen, skipper of the Standard Oil Co.'s steamer Parthemus, plying between New York and Hamburg, has recently completed his one hundredth trip across the Atlantic. Mrs. Tholen has crossed the ocean ten times with her husband.

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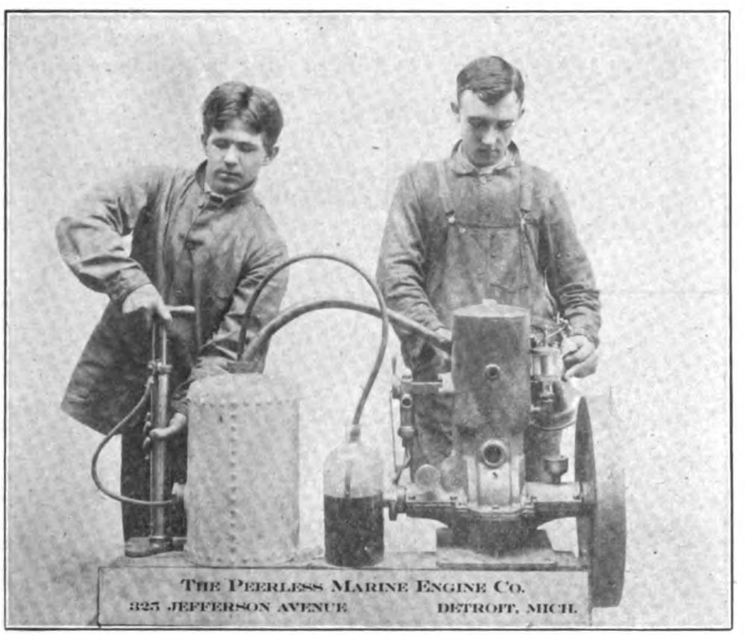
PREVENTION OF RUST.

Editor MARINE REVIEW:—We herewith show you a photograph showing the process of a new discovery we have made which we believe is most beneficial to marine engines that use salt water for cooling their jacket and are even beneficial to engines using fresh water.

For several years we have been experimenting on different chemicals and trying to produce results that would not allow the interior of the water jacket to rust. It is true that salt water does not rust while moving, but it is damaging when standing still. The photograph will show you how the chemical is syphoned and pumped to the cylinder. One hundred pounds pressure is used on the main pressure tank for forcing the chemical to the water jacket.



The jacket is warmed with a gasoline torch making the condition of the jacket very receptable for the chemical. We chemicalize all of our cylinders for marine work; can do it in a few minutes and make no extra charge for some. We have tried to rust our cylinders after they had been chemicalized by placing salmoniac in the jacket and allowing it to remain six weeks. There was positively no signs of rust and the cylinder jacket was broken away from the cylinder. We found the entire interior of the jacket in perfect condition and has shown no signs of rust.

THE PEERLESS MARINE ENGINE CO.
Detroit, Mich., June 22.

FORGED STEEL FLANGES.

"Forged Steel Pipe Flanges" is the title of a finely printed and beautifully illustrated catalog by the American Spiral Pipe Works, West Fourteenth street and Forty-eighth avenue, Chicago. The catalog is 8 by 10½ in. and contains 100 pages. Excellent taste has been displayed in the arrangement and not a blemish is to be found on any page. The catalog contains a short description of the more important features of the forged steel flange. The extremely high pressures of today and the use of superheated steam have produced strains unknown hitherto in the piping system, and the use of great iron flanges in the past has demonstrated the fact that they are unfit for modern conditions. The real remedy is found in the use of forged steel flanges which expand evenly with the pipe and stand the continuous strain and vibration. They cannot be broken by any possible condition that may arise in the piping system, as they are stronger and tougher than the pipe itself. The steel flanges are rolled and forged weldless from a solid block of steel, the cross-section of which has been reduced twenty or thirty times from the original size. In this manner the steel receives a large amount of working which is fully appreciated by those familiar with the handling of steel. When flanges are ordinarily threaded and finished, great care is exercised in threading and finishing and every threaded flange is tested with Briggs standard gages, thus insuring a perfect fit when the pipe is shipped separate. The company carries an enormous stock of standard forged steel flanges so that orders can be filled without delay.

Among the illustrations in the book is an excellent photograph of the cruiser Washington leaving the ways. This cruiser together with the cruisers North Carolina and Montana, and battleships Kansas and New Hampshire are fitted with forged steel flanges. Fifty pages of the book are devoted to illustrations of cross-sections of flanges beautifully executed in wash drawing. Some superb photographs are also shown of Spiral riveted pipe used in hydraulic mining and water supply. The catalog contains price list and index and is well worth preserving.

SCOUT CRUISER CHESTER LAUNCHED.

The scout cruiser Chester, named in honor of the Pennsylvania city, was launched from the yard of the Bath Iron Works, Bath, Me., on June 26. Miss Dorothy Wallace Sproul, daughter of William C. Sproul, state senator, christened the scout cruiser. A large delegation from Chester attended the launching. The Chester is a sister to the Birmingham recently launched from the Fore River yard, and which was completely described in the MARINE REVIEW of June 6. The dimensions of the Chester are: Length over all, 423 ft. 2 in.; breadth, 46 ft. 8 in.; draught, fully loaded, 19 ft. 1½ in.; depth amidships, molded, 36 ft. 8 in.; displacement fully loaded, 4,840 tons; displacement on trial, 3,750 tons; trial draught, 16 ft. 9½ in. Luncheon was served at the ship yard after the launching, which was most successful in every particular. President John S. Hyde presided, and speeches were made by Congressman Tom Butler, Mayor Samuel Ross Crothers and Gen. Henry Clay Cochrane.

The Buckeye Engine Co., of Salem, O., has issued a very attractive little booklet entitled "The A B C of Blue Printing," purporting to be a copy of a speech delivered by Prof. A. C. Tinic before the National Federation of Blue Printers. It certainly is a very clever little talk and is moreover clear and convincing. The booklet will be sent to anyone upon request.

The Atlantic Works, Inc., 28th street and Gray's Ferry Road, Philadelphia, Pa., have just delivered to the Ajax Metal Co. of Philadelphia, one of their pattern makers' wood lathes, 24-in. swing on 10-ft. bed.

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AUTOGENOUS WELDING.

The Worcester Pressed Steel Co., Worcester, Mass., have just installed a plant for autogenous welding with the oxy-acetylene blowpipe flame. This is the only welding plant of its kind

MAKING OXYGEN.

in Worcester and the second in this country.

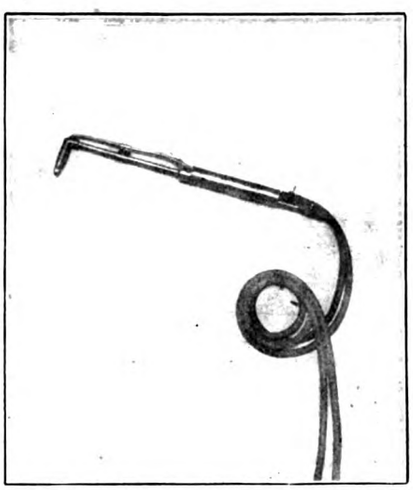
The Worcester Pressed Steel Co., following its progressive policy, quickly appreciated the practical value of adding this welding process to its modern equipment in the manufacture of high class pressed steel parts for automobiles, bicycles and many special designs in deep drawing and cold forging, requiring skilled mechanics and the best machinery.

In this welding process, they employ oxygen and acetylene in a blowpipe flame for obtaining the required heat. Each gas is generated in a separate apparatus and conveyed through separate pipes to the blowpipe. The distinctive feature which has done the most to

AT WORK IN THE SHOP.

make this welding process of wide commercial value is the introduction of a means for producing oxygen. By combining this chemical product with water, chemically pure oxygen is as easily obtained as in uniting calcium carbide and water acetylene is liberated; the chemical reaction in each case being analogous.

The oxygen generating apparatus consists of two lead lined generating chambers arranged with a scrubber and settling chamber between. In making oxygen, one generator is filled with the required amount of luke-warm water to which one chemical charge is added. While this solution is being stirred with an agitator operated by a crank, provided for the purpose, a solution of iron sulphate and water is added which acts as a catalyzer. In the following chemical reaction, 6 Fe_2 SO_4Aq + 7 $CAOCL_2Aq$ + $CUSO_4Aq$ + 2 FE_2 $(SO_4)_3$ Aq + $CUSO_4Aq$ + Fe_2 CL_6 + 7 $CACL_2$ + 3 $CASO_4$ + 7 O. the oxygen, liberated, passes from the generator through the scrubber and a



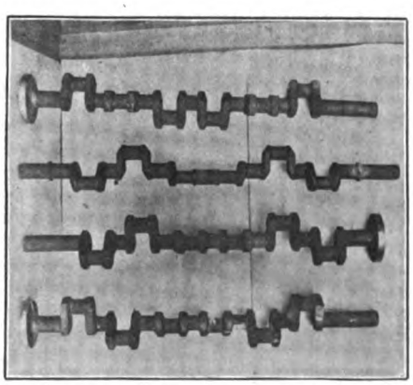
THE BLOW PIPE.

water sealed trap into the gasometer; from the gasometer, the oxygen is compressed to 10 atmospheres (47 lbs.) with an air compressor into a pressure storage tank. It is then conducted through ⅜ in. copper piping from which branches of ¼ in. copper piping lead to the blowpipe connections. Reducing valves are arranged so the operator can vary the pressure of the gas at the blowpipes at will. Each blowpipe is supplied with twenty-two different sized nozzles so the size and power of the flame are varied according to the thickness of the metal to be welded.

The acetylene generator is of the water feed type, composed of a cylindrical shaped tank, which serves as a gasometer and regulator, connected by three water supply pipes to three carbide receptacles or trays, half cylindrical in shape, each containing six compartments. Each tray holds about 12 lbs. of lump carbide. The acetylene is used under practically a uniform pressure varying from 2.2 to 3 lbs. The pressure is obtained and maintained by two water levels in the gasometer, employing as a means the principle of the well known water column, which automatically governs the supply and pressure of the gas. Any pressure in excess of 3 lbs. escapes through a vent or blow-off outside the generator building. From the regulator and gasometer, the acetylene is conveyed through a 1 in. main pipe with one ⅜ in. branch leading to each blowpipe connection.

A feature of this acetylene apparatus is a "safety valve" located between the blowpipe connections and the acetylene gasometer. This consists of a 1 in. pipe leading into and two 1 in. pipes leading out from a rectangular metal chamber. The inlet pipe connects with the gasometer. One outlet conveys the acetylene to the blowpipes, the other vents to the outside air. The inlet and outlets are separated by a water sealed trap which prevents any possibility of ignition reaching the generator and gasometer by burning back through the blowpipe supply pipes.

The blowpipe is of brass construction specially designed on the injector principle and carefully proportioned for its intended purpose. It is about 24 in. long and weighs 2 lbs. It is provided with two inlets which remain entirely separate practically the entire length of the blowpipe and enter a mixing chamber with a common outlet at the point of combustion. Acetylene (C_2H_2) is a hydro-carbon colorless gas of an ethereal odor when perfectly pure but, as ordinarily obtained, is distinctly offensive to the smell. It is



WELDED CRANK SHAFT FORGINGS.

also an endothermic (heat absorbing gas) nearly as heavy as air, having a density of 0.92 in. of air. It is obtained by bringing calcium carbide (C_2C_2) in contact with water. The final chemical reaction is indicated by CaC_2 +

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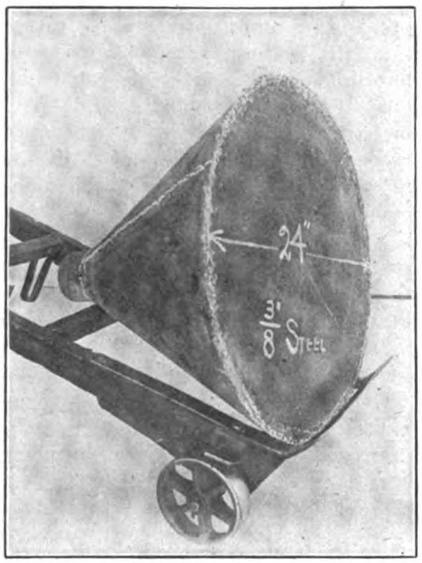
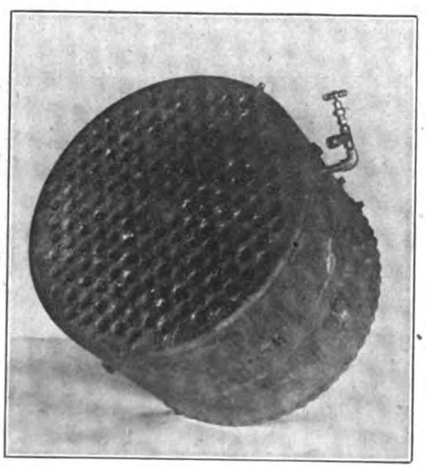
$2\ H_2\ O = C_2H_2 + CA\ (OH)_2$. As acetylene is so rich in carbon—containing 92.3 per cent—it is possible, when mixed with air in a Bunsen burner to obtain 3100 degrees Fahr. and when combined with oxygen 6300 degrees



WELDED STEEL TANK.

Fahr. is produced which is the hottest flame known as a product of combustion and nearly equals the electric arc. This is about 1200 degrees higher than the oxy-hydrogen blowpipe flame.

In lighting the blowpipe, the acetylene is first turned on full; then the oxygen is added until the flame has only a single cone. At the apex of this cone is a temperature of 6300 degrees Fahr. In welding this point is held from ⅛ in. to ¼ in. distant from the metal to be welded. Too much acety-



STEEL TUBE WELDED INTO BOILER SHELL.

lene produces two cones and a white color; an excess of oxygen is indicated by flame assuming a violet tint.

Theoretically, 2½ volumes of oxygen are required for complete combustion of one volume of acetylene. Practically however, with the oxy-acetylene blowpipe the best welding results are obtained with 1.7 volumes of oxygen to one volume of acetylene. The acetylene is, therefore, not completely burned with the blowpipe, according to the reaction—(1)

$$2\ C_2H_2 + 5{-}O_2 = 4\ CO_2 + 2H_2O.$$
$$4\ \text{vol.} \quad 10\ \text{vol.}$$

but it is incompletely burned according to the reaction — (2)

$$C_2H_2 + O_2 = 2\ CO + H_2$$
$$2\ \text{vol.} \quad 2\ \text{vol.}$$

This is understood when we consider that at the intense heat produced by this combustion, the water and carbon dioxide formed by reaction (1) are completely dissociated. To this last fact is chiefly due the success of the oxy-acetylene flame as a welding agent. To establish the proper conditions for autogenously welding two metals it is necessary to bring them to their melting point without oxidizing or carburating. As shown by the formula, this flame consists largely of carbon-monoxide which is being converted at its extremity into carbon dioxide. This, with the hydrogen, form a relatively cool jacket which protects the molten metal and the inner cone from loss of heat.

At the moment of initial combustion, when the acetylene is decomposed into elements of carbon and hydrogen, about 300 B. T. U. per cubic ft. of the gas are generated.

The total heat, however, generated per cubic ft. of acetylene is about 1500 B. T. U. which, aside from the initial decompositon is furnished mainly by the combustion in oxygen of the carbon into carbon dioxide and in lesser degree by the combustion of hydrogen into water vapor. Pure acetylene at a pressure of less than 30 lbs. even when passed through pipes at white heat, is perfectly safe, but when mixed with oxygen (or air) is dangerous. An explosive gas mixture enclosed in a pipe does not inflame at once throughout the entire pipe but from one end of the pipe, ignition travels at a certain speed which increases as the square of the pipe section; therefore to render safe the use of oxygen and acetylene in the blowpipe flame, the gas mixture is given a speed by pressure greater than the rate of propagation of the flame. No flux or molds are required to weld metals such as iron, steel and copper, but for alloys viz., brass, bronze, etc., a little borax or boracic acid, moistened with water, is used simply to prevent the volatilized zinc from being deposited on the joint and destroying the weld. This process welds by fusion. forming a perfect metallic union of the parts, which is imperceptible after finishing. It is not brazing.

The Worcester Pressed Steel Co. employ it in place of riveting and soldering and for other forms of metal construction not heretofore possible. Two sheets of metal may be welded by placing their edges in contact and following along the seam with a blowpipe. Tanks of almost any shape may be made by forming the body and ends separately and, in assembling, tracing the seams (joints butt and flush) with a blowpipe.

To insure strength, the joint is slightly overloaded by melting a wire or rod of same material as metal to be welded, at the same time the edges are fused. The unfinished joint is stronger than the body of the metal and the finished joint is practically the same.

Any shaped hole can be easily cut in steel plates up to 6 in. in thickness, as with the blowpipe the operator can accomplish cutting feats impossible with a saw. In cutting the flame is proportionately elongated by pressure to penetrate to the bottom of the cut. The intense heat is so localized that the kerf is practically the same as if a saw were used.

Not only is this process adapted for making tanks, boilers, tubing, cylinders, pipe joints and angles and for replacing brazing and riveting in many instances, but it effectively welds cast iron.

In the foundry this apparatus saves defective castings in iron, steel, brass, copper, etc., for the blowholes can be readily filled and broken castings welded as strongly as new. In repair work it is especially valuable and many expensive castings, forgings and machined parts may be saved from the junk pile by an hour's use of this blowpipe.

An operator of average ability can weld steel or copper sheets at the rate and cost for gas approximately as follows:

0.035″	(about 1-32)	288″ per hour,	$0.0031	per inch.
0.062″	(about 1-16)	200″ per hour,	0.0065	per inch.
0.125″	(about 1-8)	120″ per hour,	0.016	per inch.
0.377″	(about 3-8)	60″ per hour,	0.075	per inch.

Metals ¼ in. and less in thickness can ordinarily be welded cheaper than riveted. Steel and copper tanks for high and low pressure of almost any dimensions, are effectively welded in place of riveting; broken steel shafts and other forgings repaired; cast iron welded with copper or steel and blow-

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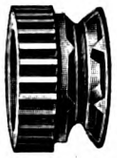
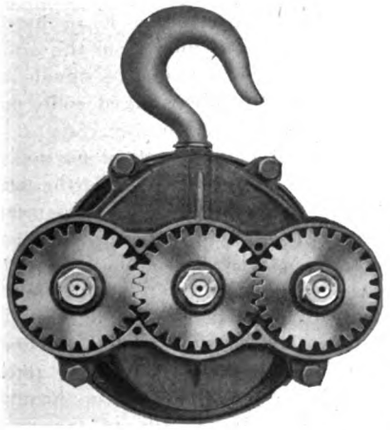
holes and similar defects in castings and forgings made good.

The Worcester Pressed Steel Co. have accomplished some difficult autogenous welding with aluminum, practically overcoming the trouble from the oxide which forms on the surface of aluminum when exposed to the atmosphere. Although aluminum melts at a comparatively low temperature (1,200 degrees Fahr.) it rapidly conducts and absorbs heat and requires a comparatively high local heat to obtain the best results.

CYCLONE HOIST.

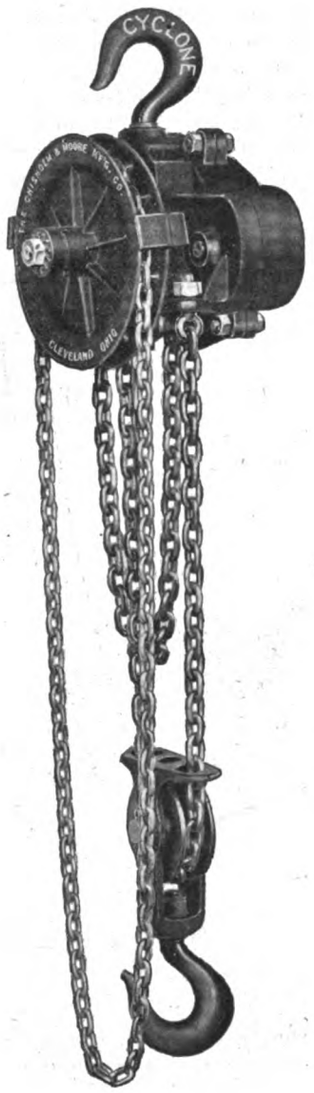


The Cyclone high speed chain hoist, manufactured by the Chisholm & Moore Co., Cleveland, is one of the most popular hoists on the market. The bearings of the hoist have graphite bronze bushings. They are self-lubricating, requiring no oil, and will run indefinitely without cutting. The lift wheel, that is the sprocket wheel which carries the lift chain, is cast in one place with the spur wheel that drives it. This double wheel turns freely upon a hollow shaft rigidly supported at both ends in the frame. The spur wheel is encircled by a yoke having internal teeth meshing into the spur wheel teeth and driven with a gyrating movement about it by two eccentrics placed di-



ametrically opposite. The hand wheel shaft passes through the hollow main shaft carrying at the further end a pinion which drives two spur wheels, one on each of the two eccentric shafts.

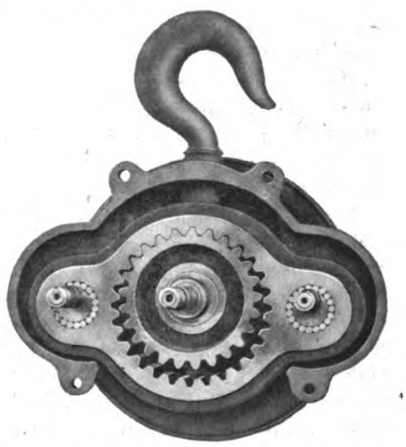
The number of the teeth in the spur wheel divided by the difference between the number of the spur wheel teeth and the number of the internal teeth of the yoke equals the number of revolutions of the eccentric necessary to turn the lift wheel once. (In the one-ton size, the spur wheel has twenty-one teeth, the yoke twenty-four internal teeth, and the eccentrics turn seven times to each revolu-



tion on the lift wheel.) The teeth are cut with accuracy and work smoothly together. There are a number of them in contact, insuring great strength. The eccentric shafts have bearings at both ends and roller bushed connection with the yoke. All bearings have self-lubricating graphite bronze bushings. There are no overhanging bearings in the hoist, so that under the full load the frame will not spring and bind the working parts. The extreme simplicity and great strength of this construction is apparent. It is practicable for the twenty-ton size, as for the half-ton without undue increase in size or weight.

The friction loss of this movement is so slight (the efficiency is about 80 per cent), that it has been found practicable to gear the hoists to a very high speed, higher than that of any other hoist yet manufactured, without increasing the hand wheel pull above that of other slower hoists. The one-ton Cyclone overhauls only 29½ ft. of hand chain to raise the maximum load 1 ft. with a pull of 85 lbs. The 2-ton Cyclone overhauls 39½ ft. of hand chain to raise the maximum load 1 ft. with a pull of 125 lbs.

The average speed of the best types of screw hoists in the 1-ton size is 60 ft. overhaul of hand chain with a pull of 88 lbs. and in the 2-ton size 90 ft. overhaul of hand chain with a pull of 120 lbs. to raise the load 1 ft. So that with the same power applied, the load can be raised with the Cy



clone high speed hoist more than twice as rapidly as with the best types of screw hoists. Comparison is made with the screw hoist, as most users of chain blocks are familiar with the working of that type.

The automatic brake permits the spinning of the hand wheel in either direction when there is no load, locks the load with perfect safety, and yet permits its free lowering by a very slight reverse pull on the hand chain.

SPENCE PACKAGE FREIGHT CONVEYOR.

To reduce the amount of labor and trucking necessary in the loading and unloading of package freight the Spence Mfg. Co., St. Paul, Minn., has devised a portable, motor driven conveyor operating between the dock and boat. The conveyor is built in varying lengths as desired and consists of a truss frame on which is mounted a flexible endless traveling apron. This apron is built of jointed slats with an individual panel for each separate box, barrel, bale or bag loaded on. In the center of each panel is a button which is pressed down by whatever is put on it and the finger with which it connects is thus made to engage with a counter

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as the apron moves along. This arrangement provides an absolutely accurate method of automatically counting each item conveyed into or out of the boat.

The driving of the conveying apron is accomplished by means of chain and sprockets, the chain fastened to the underside of the apron and within the frame and the sprockets on shafts at each end. The driving motor is placed centrally within the conveyor and is connected up with driving sprockets. The conveyors built in sections may be made to serve any area or length of dock by laying the extension sections end to end with the main conveyor. Small sprockets on the outside of the end shafts of each transmit power from the motor of the main conveyor through as many sections as desired. Chain adjustments are provided both for the end axles and the motor.

The carrying apron runs on steel, roller bearing rollers, placed two inches apart on both sides of the conveyor so that its movement requires a minimum of power. The whole conveyor is mounted on roller bearing truck wheels so that it is readily movable as desired. The main conveyor can be set at any angle as can also the extension conveyors and side boards are provided where required.

This device, which is guaranteed should operate to great advantage both in the saving of time and expense as well as in the reduction of labor required. Two of these conveyors are now being installed on the docks of the Western Transit Co. at Buffalo.

RECEIVER FOR SYSTEMS OF SUBMARINE SIGNALING.

In the accompanying drawings are shown three views to illustrate certain

Fig. 1

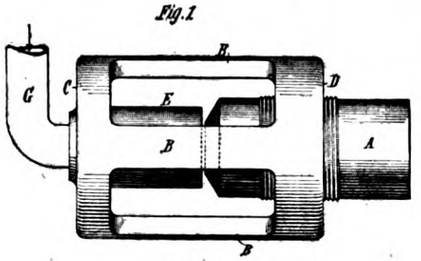
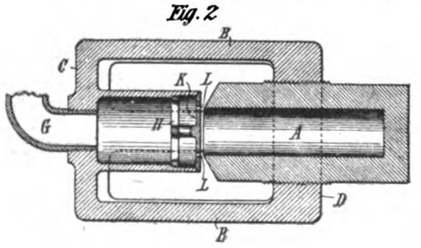


Fig. 2



new and useful improvements in receivers for systems of submarine signaling, the invention of Lucien I. Blake, of Boston, Mass.

Fig. 1 is a view in elevation of the sound producer. Fig. 2 is a longitudinal cross-section of the operative parts of the same. Fig. 3 is a sectional view of the sound receiver in which the invention, upon which the present application is based, is embodied.

Referring to Figs. 1 and 2, A is a cylinder of steel shown as closed at one end and with the other open end beveled at an angle of about 60 degrees to sharp edges. It is not necessary that

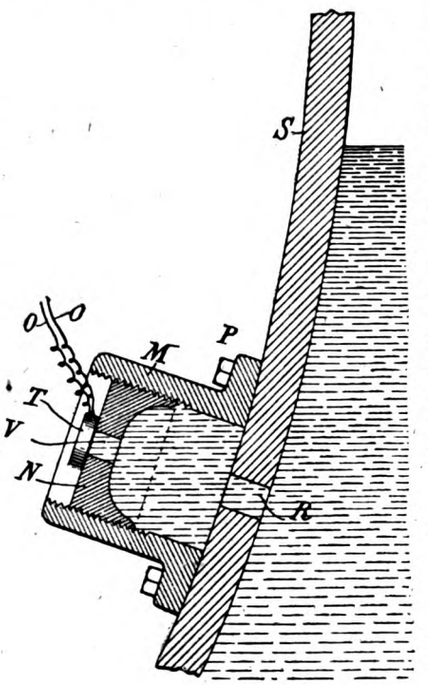


FIG. 3.

the cylinder be closed, but, to secure the same free period of vibration of a column of liquid within it, an open cylinder must be of double the length. In practice the inventor has found that for good results a cylinder designed for a given pitch and having a bore of three inches in diameter and 11 inches long should have walls 1½ inches in thickness of very hard tough steel built up by shrinking several tubes, one over the other.

B, B, are side bars connecting with heads C, D, of a rigid frame. In the head C is secured a chamber E, provided with an inlet through which water is introduced by a pipe G from any suitable source capable of delivering it at a high pressure. Within the chamber E is a spider H carrying a plate K of slightly smaller diameter than an opening in the end of the chamber, and which therefore leaves an annular orifice L preferably of about 1-32 of an inch in width. In the head D is a circular opening with threaded walls with which corresponding threads on the exterior of the cylinder A engage. By this means the cylinder is rigidly supported with its beveled edge in proper position relative to the annular orifice L and with the capability of adjustment with respect thereto. The cylinder A is adjusted to bring its edge in close proximity to the annular orifice L, and is submerged at any desired point where the sounds or signals are to be produced.

Water under pressure, preferably from 125 to 200 pounds, is supplied to the chamber E, and issuing therefrom in the form of an annular jet impinges upon the edges and beveled end of the cylinder A, with the result that the harmonic or regular periodic vibrations are set up in the column of water within the cylinder. These vibrations, owing to the unyielding character of the boundaries of the chamber or cavity in which the column of water is contained are reflected back and forth from the walls and the column is therefore set in sonorous resonance. Such an apparatus will produce a tone of definite pitch dependent upon the dimensions of the chamber or cavity within the cylinder A. The inventor has found that sounds thus produced will be carried to great distances through water, and may be detected and rendered audible by suitable sound receiving instruments the more readily because of their distinctive musical character. By interrupting or varying the pressure of the water supplied to the chamber E, or by deflecting the jet issuing from the orifice in said chamber, distinctive signals, according to any prearranged code, may be sent by this device.

In Fig. 3 S represents a portion of the skin of a steel vessel. To the inner surface of the skin is secured, by means of bolts passing through the flanges at its end, a steel cylinder M of the same character as that described in connection with Figs. 1 and 2. The opposite or inner end of the cylinder is closed by a head N of corresponding thickness, the edges of which are threaded to engage with threads in the inner surface of the cylinder. A small orifice B is formed in the head and an ordinary microphonic transmitter T is secured over the same or placed at any point at which it will be operated by the resonance of the column of water contained in the cylinder. Wires O, O, connect the microphone with an ordinary telephone receiver. A small opening R may be drilled through the skin of the ship in order to permit access of the water into the cylinder but is not necessary as sounds coming through

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the water would be transmitted through the wall of the ship to the water column in the cylinder, even were no passage of communication present. The head, by means of its threaded connection with the cylinder, may be adjusted to vary the dimensions of the chamber within the cylinder, and thus control the pitch of the resonant cavity in order to tune it to any desired source of sound. The column of water within the cylinder will be set in resonant vibration by a given sound transmitted to it through the water and entering either through the ship's wall or the opening therein. The sound thus intensified operates the microphone, which produces in the telephone receiver an audible sound.

While the invention has been described by reference to a specific form of apparatus, it is evident that its construction may be greatly varied. In general, the sound receiver may be submerged at any selected station or placed in a tank attached to the walls of a vessel so that, by means of the apparatus, signals may be transmitted from the shore to the vessel, or, conversely, or between vessels within the limits of practical transmission.

AKERS EMERGENCY STEERING GEAR.

The Akers Steering Gear Co., 1590 Old Colony building, Chicago, is putting its emergency steam steerer upon a number of the new freighters. This emergency gear will be installed upon the new steamers W. M. Mills, Leland S. DeGraef, Wilpen, Ontario Car Ferry No. 1, and upon the new steamer building for Ed. Mehl of Erie, Pa. Quite a number of serious accidents have happened since the opening of navigation which emphasizes the necessity of an auxiliary gear entirely independent of the regular steering gear and engine. The Akers steam steering gear is one that can be thrown into operation instantaneously from the bridge and operated by the officer in charge should anything happen to the regular apparatus. Accidents are expensive things to vessel owners because the insurance companies do not make good time lost. It is nearly always in the restricted channels that the regular gear gives out owing to the strain put upon it by ramming the wheel hard over at the turns and it is in precisely this situation that an emergency gear keeps the vessel from stranding. The Akers emergency gear is especially commended by Inland Lloyds.

SHERIFFS MANUFACTURING CO.

The Sheriffs Manufacturing Co., Milwaukee, Wis., have just completed repairs on the engine of the steamer John Schroeder which consisted of a new low pressure piston head and distance piece between cylinders. The company has put in a new stern pipe on the steamer Black Rock. It is building an 8-inch by 10-inch high pressure engine for a small fish tug for Renpferd Brothers, the hull being built by Burger of Manitowoc. It is also building a new engine for M. Treu & Co., the hull being built by Benning of Milwaukee. It is also furnishing a new set of steel blades for the steamer Christopher Columbus. Among recent orders are the following: A 10-ft. wheel for Green Bay, a 6-ft. wheel for Milford, Pa., a 66-in. wheel for New Orleans, and a 11 ft. 6-in. wheel for Chicago. The company is just shipping a double engine, 7-in. by 10-in. cylinder, double drum pile driver for the C. H. Starke Dredge & Dock Co., being the third one of this make in use by the same firm. A new wheel has just been put on the tug Fisher and repairs completed to the machinery of the steamer Oregon.

COLUMBIAN ROPE CO.

In 1891 the Columbian Rope Co., of Auburn, N. Y., organized a rope and binding twine industry in competition with the National Cordage Co., which at that time practically controlled the rope and binding twine business in the United States. The Columbian Rope Co. has prospered since it was founded. In addition to manufacturing rope from manila and sisal it established two years ago a department for the manufacture of commercial twines from jute, American, Russian, and Italian hemp. This part of the business has grown so rapidly that the company is now engaged in building a new mill, 100 ft. wide and 600 ft. long, one-half of which is three stories and the other half four stories high. The company today manufacture every kind and class of rope known to the trade.

D. T. WILLIAMS VALVE CO.

The D. T. Williams Valve Co., 521-523 Hunt street, Cincinnati, O., manufacturers of high grade engineering appliances consisting of brass and iron valves, gage cocks, fittings, oil and grease cups, lubricators, steam traps and separators, has just issued a catalog superseding all previous issues. It is really the first general catalog that the company has issued. Since the last catalog was issued the company has erected new shops and are manufacturing a great variety of engineering specialties. Customers are therefore advised to destroy all previous catalogs and to secure one of the new ones. The catalog contains as a frontispiece a very fine wash drawing of the company's plant at Cincinnati. The index is also published on the front pages and is nicely arranged, so that it is immedately possible to locate any subject desired. The price list is very complete. In addition in the rear pages a great deal of data of interest to engineers and others is published. The catalog concludes with a cipher code for telegraphing orders.

ALMY WATER TUBE BOILERS.

The Almy Water Tube Boiler Co., Providence, R. I., recently shipped two boilers for the steam yacht Bellemere, one for the steamer Griswold, of New London, one to the Narragansett Bay Oyster Co., Providence, R. I., and one to Walter Stebbins & Sons, of Baltimore. Two were shipped to Luna Park, Seattle, Wash., and one to H. G. Campbell, of Portland, Ore. The company recently made a complete installation in the steam yacht Onondaga and are just finishing three for South American parties. One boiler was also recently shipped to Capt. R. T. Potter, Lewes, Del.

NICHOLSON SHIP LOG.

The Nicholson ship log and speed indicator has been received with favor upon every ship upon which it has been installed. The following ships have recently been equipped with a Nicholson log: The Canadian cruiser Vigilant, the wrecking tug Favorite, the Southern Pacific Co.'s new ships Momus, Antilles and Creole, the Pacific Coast Co.'s new ships President and Governor, also their steamships City of Pueblo, Queen and Senator, and the New England Navigation Co.'s new ship, the Massachusetts. The log of the Massachusetts is published elsewhere in this issue.

The Franklin Filter Co., 308 North Commercial street, St. Louis, Mo., has issued a catalog describing the Franklin oil filter under the general title of "Efficient Bearings." Bearings are easy to operate if the oil is always pure and clean. The efficiency of the bearing depends upon the oil filter. The catalog describes the filter, giving prices for various sizes, and announces that the filter will be sent upon approval subject to thirty days' trial.

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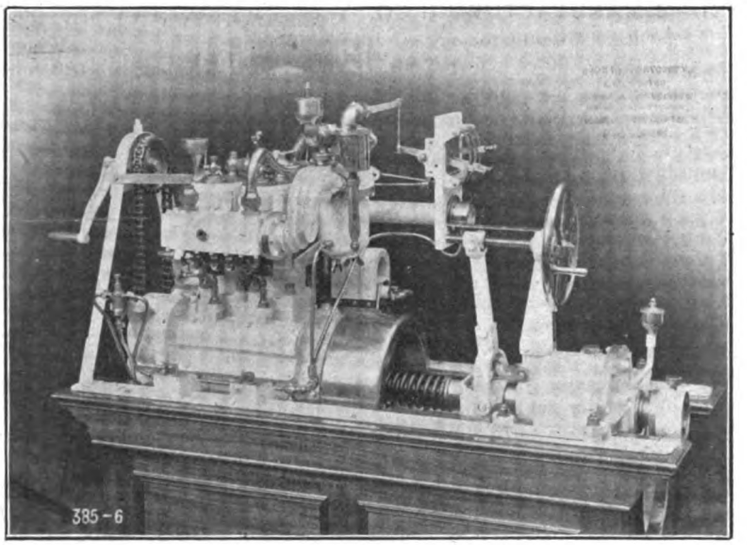


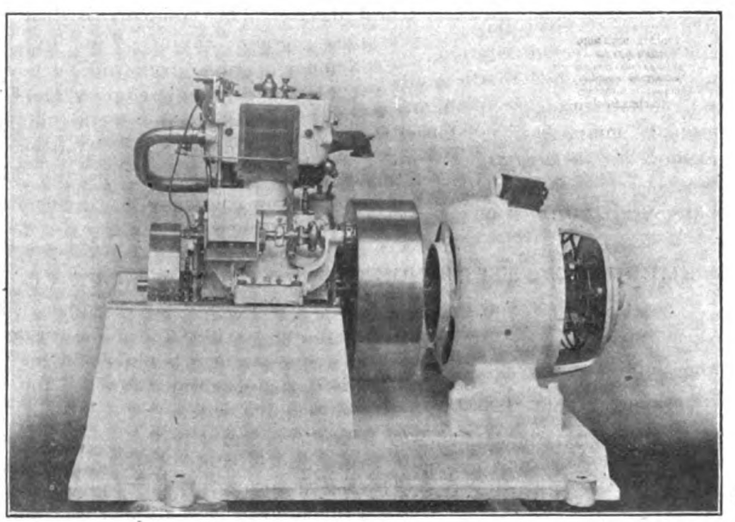
12 B. H. P. MOTOR AND REVERSING GEAR.

THORNYCROFT MOTORS.

The Thornycroft motor has four cylinders 8 in. diameter by 8 in. stroke and develops 100 B. H. P. on petrol, or 75 B. H. P. on paraffin, either power at 750 revolutions. Motors of this type are now being largely adopted for the propulsion of large cruising launches and yachts, and an order has recently been received for an installation of three of these motors for a new vessel now under construction for a noted British yachtsman. A motor of this type is fitted in the Firefly which took part in the Gravesend to Cowes run immediately prior to the Reliability Trials last year, doing the journey in nearly seven hours less time than any boat competing in the race. This motor is illustrated connected up to the Thornycroft reversing gear.

The second motor illustrated herewith has two cylinders 4½ in. diameter by 5 in. stroke, and develops 12 B. H. P. on petrol and 10 B. H. P. on paraffin, both at 1,000 revolutions. It has been specially designed for the propulsion of craft up to about 35 ft. for either commercial or pleasure purposes, and has given general satisfaction in such service. It is extremely simple to handle, and its reliability has been proved beyond question at the various trials in which motors of this type have been used.

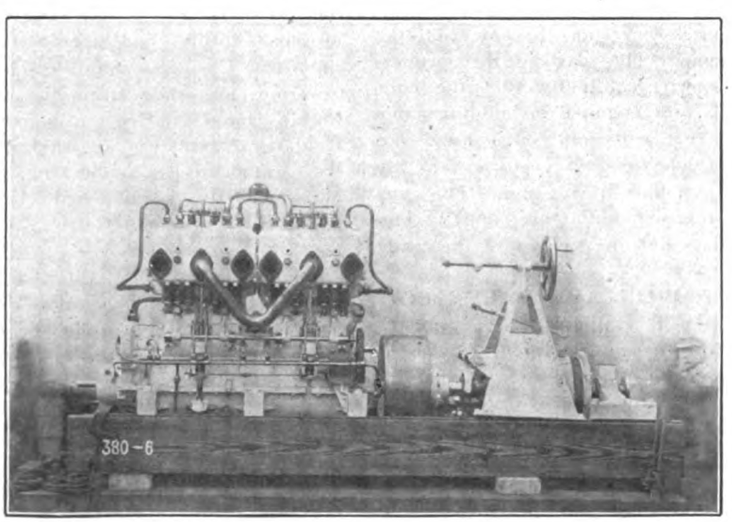
The third motor is intended to demonstrate a very simple and effective arrangement for electric lighting country houses, sailing and other vessels. This type of engine has proved very successful in the hands of amateur motor launch owners, who particularly appreciate the marked superiority compared with other single cylinder engines. Various types and



6 B. H. P. PETROL MOTOR AND DYNAMO.

sizes of Thornycroft motors have been employed for stationary purposes (i. e., for working pumps; capstans; electric lighting, etc.), invariably with most satisfactory results, both as regards economy of fuel, as well as very small amount of attention and adjustments necessary. It should be added that any of these motors may be adapted for using either petrol or paraffin; and a special arrangement may be provided to use paraffin and petrol together, i. e., one fuel may be turned off and the other on, without any preparation, while the motor is running. In view of petrol being as expensive as it is at present the possibility of using paraffin with but a slight reduction in the power is a matter which deserves serious consideration by users of marine motors.

The Thornycroft motor (of all



100 B. H. P. THORNYCROFT MOTOR AND REVERSING GEAR.

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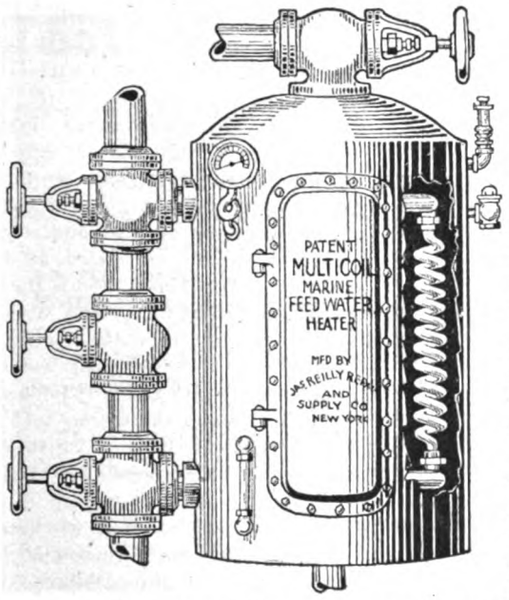

THE PATENT

MULTICOIL

FEED WATER HEATER

Combines the greatest efficiency in the smallest space at the least cost.

Condenses all the auxiliary exhaust steam in heating the feed water, thereby relieving the main condenser. Requires but one feed pump. Delivers feed water at approximately the temperature of the steam in the heater. The copper coils are very elastic, overcoming the leakage due to expansion and contraction. These tubes are easily accessible and can be readily removed or replaced; they are standard and interchangeable.

The Multicoil Heater is absolutely automatic in action and once adjusted needs no further attention

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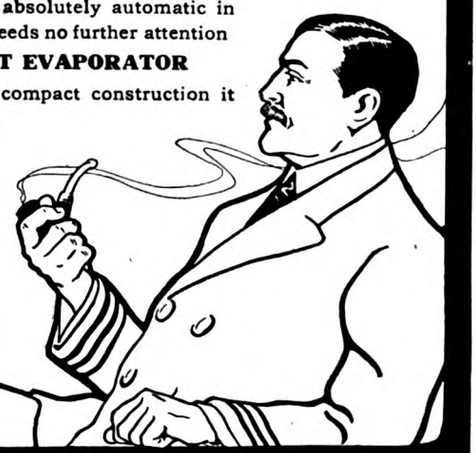

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Our Men find that there is nothing better on the market for cleaning the hands than "Klenzola." They would not be without it. COOKE-WILSON ELECTRIC SUPPLY CO., Pittsburg, Pa.

Klenzola has all the qualities you claim for it. Our men speak highly of it and consider it the best hand soap for removing Machine Grease, etc, they have ever used We like it and want it. UNION IRON WORKS, Erie, Pa.

You may enter our order for One Gross Klenzola. There is quite a demand from steamboat engineers now for this article; they say it is very effective in removing grease from the hands.
J. A. BOYINK, Storekeeper,
Pittsburg Steamship Co., Conneaut Harbor, Ohio

We have many others like the above, which we will furnish on request.

We want good Agent in every city in the U. S. Write for free sample and agent's terms. Secure the agency now. If your dealer doesn't handle it, ask him to.

KLENZOLA CO., Erie, Pa.

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types) is guaranteed to give unimpaired efficiency with paraffin, and the reduction in power is, as we have already shown in describing the motors, very small indeed.

EJECTORS AS LIQUID ELEVATORS AND CONVEYORS.

There is a little machine known as an ejector, whose large field of usefulness is not yet appreciated by a great many users of steam. It is marvelously simple in construction, requires but a small amount of steam—far less than a steam pump—and on account of its compactness and portability, allowing it to be placed with little expense near the work to be done, is becoming a common substitute for steam pumps, syphons, etc.

It would be difficult to enumerate all the uses to which an injector is adapted, but when we say that anything and everything in the nature of

"XL-96" EJECTOR.

a liquid (if not too thick) can be transported from one level to another, or horizontally any reasonable distance, the ground is just about covered.

Take, for instance, such plants as breweries, chemical houses and other concerns using heated liquids, the "XL—96" ejector is indispensable and unrivaled in its simplicity of operation. It is also an unexcelled agency for raising liquids from wells, tanks, mines, vessel holds, docks, etc.

Distilleries, creameries, tanneries, dye works, paper mills and plants of like character employ them almost entirely for raising and syphon purposes.

Complete information as to the "XL—96" ejector and its uses may be obtained by writing to the manufacturers, Penberthy Injector Co., Detroit, Mich.

THE CARBON STERILIZER.

The carbon sterilizer is the name of a new process for preserving meat, fish, poultry, and all natural porducts, in the hottest weather. It is being brought forward by the Universal Produce Preservation Co., Ltd., 66 Farringdon street, London, E. C. By treating the meat by this process for 30 minutes or longer according to bulk and weight, but in no case exceeding one hour, it can be exposed to the atmosphere for prolonged periods, retaining all its natural freshness and flavor. The cost of preserving 1,400 lbs. of meat is eightpence. The process is as follows: The meat is simply placed in the airtight chamber of the machine, from which all impure air is extracted by means of a centrifugal pump, and fresh sterilized and dried air is then introduced, together with the vapor generated by one or more carbonine pastilles, which vapor impregnates the meat without making any alteration to its taste, smell, or color. The process is absolutely harmless to health, and in addition all the harmful moisture of the meat is absorbed by the sterilized air. Half an hour's treatment will suffice for average quantities, and meat treated in this way will resist the deteriorating effect of any atmosphere for an indefinite period. The process is one of immense value on board ship.

TWO NEW HUDSON RIVER STEAMBOATS.

Two new steamboats are now under construction, one each for the Peoples line, between New York and Albany, and the Citizens line, between New York and Troy. The Peoples line steamer will be constructed of steel and will in many respects be similar to the C. W. Morse. She will be 440 ft. in length with over 500 staterooms, many of them in suites with bath, and will have sleeping capacity for about 2,000 passengers, thus making her the largest and most luxurious river steamboat in the world.

The new Citizens line steamer will be 350 ft. in length with approximately 275 rooms and a carrying capacity of about 1,200 passengers. Though somewhat smaller than the Peoples line steamers she will be most modern in her various departments, superbly equipped, and by far the most magnificent steamer yet constructed for service between New York and Troy. Each of these vessels will be ready for the Summer business of 1908.

The hull of the Peoples line steamer is under construction at Camden by the New York Ship Building Co., and that of the Citizens line at the Marvel & Co. Ship Yard, Newburgh, N. Y. The engines for both steamers will be constructed by the W. & A. Fletcher Co., Hoboken, N. J., who are the contractors for the vessels complete. The interior fittings and superstructure will be furnished by Charles M. Englis, Greenpoint, L. I.

The offices of the New York & Cuba Mail Steamship Co have been removed from 90 Wall street to Pier 14, East river, New York city.

"TELL IT TO THE MARINES."

The saying, "Tell it to the marines," is traced to Pepys, the author of the famous "Diary," and it is said by him to have originated with Charles II of England. It so befell, as the story goes, that his lighthearted majesty, with an exceedingly bored expression on his swarthy face, was strolling in the shade with the ingenuous Mr. Pepys, secretary of the admiralty.

"I had speech yestere'en at Deptford," said Mr. Pepys, "with the captain of the Defyance, who hath but lately returned from the Indies and who told me the two most wonderful things that ever I think I did hear in my life." Among the stories told were of fish flying in the air. "Fish flying in the air," exclaimed his majesty. "Ha! ha! a quaint conceit, which 'twere too good to spoil wi' keeping! What ho! sir"—he turned and beckoned the colonel, Sir William Killigrew, of the newly raised maritime regiment on foot, who was following in close conversation with the Duke of York—"We would discourse with you on a matter touching your element. What say you, colonel, to a man who swears he hath seen fishes fly in the air?"

"I should say, sir," returned the sea soldier simply, "that the man hath sailed in southern seas. For when your majesty's business carried me thither of late I did frequently observe more flying fish in one hour than the hairs of my head in number."

His majesty glanced narrowly at the colonel's frank, weather-beaten face. Then with a laugh he turned to the secretary.

"Mr. Pepys," said he, "from the very nature of their calling no class of our subjects can have so wide a knowledge of seas and lands as the officers and men of our loyal maritime regiment. Henceforth ere ever we cast doubts upon a tale that lacketh likelihood we will first tell it to the marines."

The Knecht Bros. Co., Cincinnati, has put out a catalog descriptive of the Knecht friction sensitive drill for drilling holes up to 9-16 in. In the Knecht friction drill the ordinary devices for driving the spindle and changing the speed such as stepped pulleys and gears have been replaced by an exceedingly simple but effective friction device. This is the feature which distinguishes the Knecht. It is the simplest, most sensitive and most convenient method of adapting a drill to the wide variety of work ordinarily required of these tools.

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The Upson-Walton Co.

CLEVELAND, OHIO

AMONG the first vessels that we fitted out was the Nellie Redington. That was nearly forty years ago, but the Nellie Redington is still afloat.

Among the latest vessels that we have fitted out is the Henry Phipps.

The Redington carries 1,500 tons; the Phipps, 12,000 tons.

As 1,500 is to 12,000 so is The Upson Walton Co. of thirty-six years ago to the Upson Walton Co. of today.

Our reputation as Outfitters of Vessels has grown year by year.

EVERY PASSENGER STEAMSHIP

has, or should have, a refrigerating system. Yet how many of these installations represent the best engineering practice?

An ammonia refrigerating plant, to operate economically, should be equipped with WELDED pipe line joints. Such joints eliminate leakage losses and avoid maintenance charges.

Write us regarding our THERMIT PROCESS for welding pipe joints IN PLACE without the aid of outside power of any kind. Our Pamphlet No. 16-E gives this information.

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90 West St., NEW YORK
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SAN FRANCISCO

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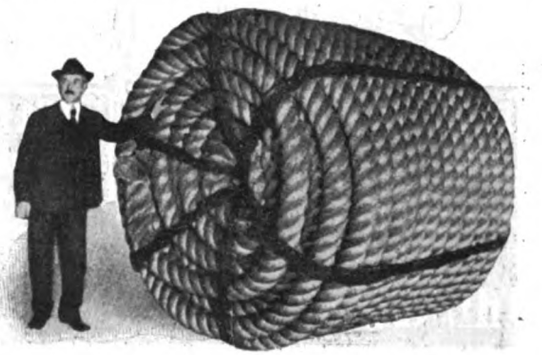
HULLS and CARGOES

DIRECT REPRESENTATIVE OF LEADING AMERICAN AND FOREIGN UNDERWRITERS

Manila Rope That Wears

When buying rope for marine service quality should be considered first. A small cut on the price will not make up for **40 to 50% longer service** to be had from first-class Manila.



Let us submit samples. They will show the quality.

Buffalo Ship Chandlery & Supply Co.

11 & 13 MAIN ST., BUFFALO, N. Y.

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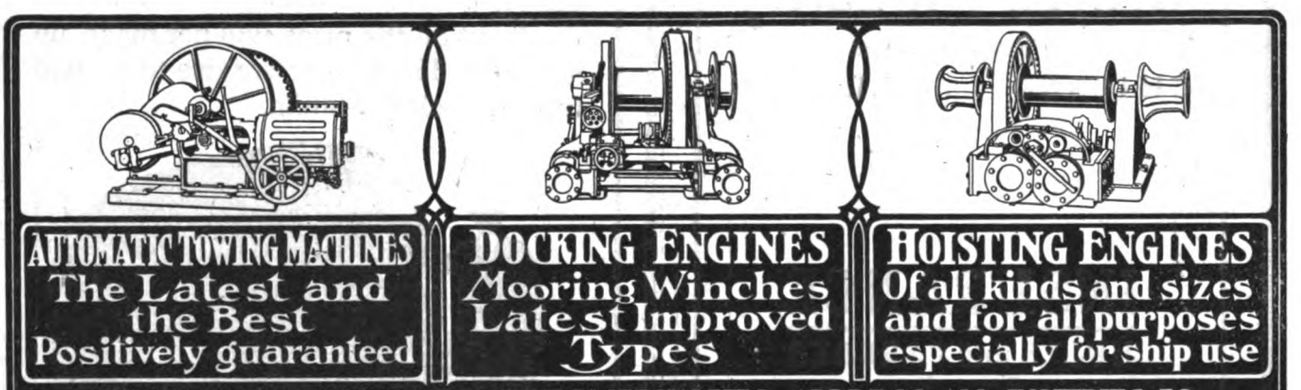
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FOR THESE AND OTHER WELL KNOWN SPECIALTIES ADDRESS ALL INQUIRIES TO
THE CHASE MACHINE CO. ENGINEERS AND MACHINISTS CLEVELAND, O.

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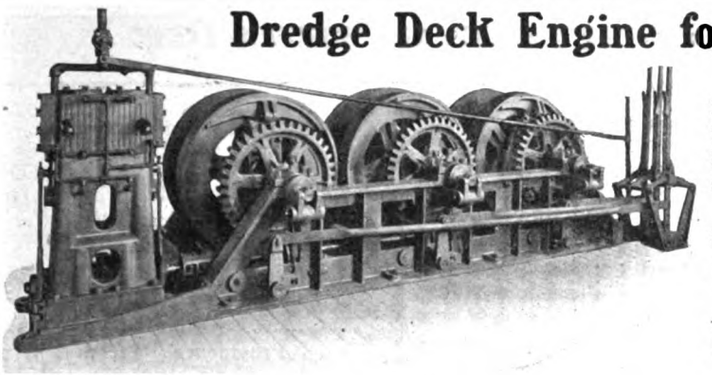
Dredge Deck Engine for Handling Dump Scows



Wire lines are used with this machine, instead of Manila, and we have the testimony of those using them that they will **SAVE THEIR COST IN ONE SEASON.** Built in two sizes. (The cut shows small size.)

We also build **STEAM SCOW WINDERS** for raising the hopper doors by power. **WILL WIND UP A TENHOPPER SCOW IN TEN MINUTES.**

Write for circulars and particulars.

SUPERIOR IRON WORKS,

Superior, Wis.

G

Wrecking Steamer FAVORITE

Located at St. Ignace this Year.

The New Wrecking Steamer FAVORITE, Alex. Cunning, Master, will be stationed during season 1907 at ST. IGNACE, MICH. A Long-Distance Telephone will be installed on board the steamer. When at her home dock, the steamer can be reached by telephone any time day or night, 'Phone Number 63, and in absence of steamer full information as to the steamer may be obtained by telephoning to residence of Capt. Cunning, St. Ignace.

The Favorite is the most complete wrecking steamer in the world and is capable of going anywhere in all weathers.

Smith's Coal Dock

DETROIT RIVER

DETROIT, MICH.

12 Pockets. Platform.

Low Dock

Operated by

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Steamboat Fueling Facilities at Various Points on the Great Lakes

CLEVELAND HARBOR { 4 Car Dumpers. 3 Lighters. | FAIRPORT HARBOR { 1 Car Dumper. 1 Lighter. | ERIE HARBOR { 1 Car Dumper. Fuel Lighter.

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CLASSIFIED ADVERTISING SERVICE

PROPOSALS.

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., June 26, 1907. Sealed proposals for Repair of North Pier at Holland, Mich., will be received here until 3 P. M., July 26, 1907, and then publicly opened. Information furnished on application. M. B. Adams, Col., Engrs.

DREDGING EQUIPMENT FOR SALE.

ONE COMBINATION DREDGE in Fine Condition for sale, fully equipped with all appliances for operating both clam and dipper, hull rebuilt and machinery put in first-class condition two years ago. Can be seen at River Rouge, Mich. Also a floating derrick, care of Buffalo Dredge Co., Buffalo, N. Y. Address W. S. Carkin, Bennington, N. H.

COAL HANDLING MACHINE

ONE BROWN RAPID COAL Handling Machine for sale. Now in use at Toledo Docks. This Machine is in very fair shape and is to be replaced by one of larger capacity. Will be glad to furnish any information to interested parties.

C. B. Duffy, P. A.
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AGENT WANTED

A GOOD LIVE AGENT WANTED to handle "KLENZOLA" for Marine trade. The best preparation known for removing machine grease or dirt of any kind. Put up in ½ lb. cans. Retails for 10 cents, harmless, but effectual. Agents can make from $10.00 to $50.00 a month extra beside their regular work. Write for sample and agents' prices. Klenzola Company, 13-15 West 12th St., Erie, Pa.

VESSEL BROKER.

TALK WITH BRADLEY.—Before buying or selling a boat. I have vessels of most every kind—from 10 tons to 6,000 tons—to sell for owners. Anybody wishing to buy or sell boats should call or write.

Fred A. Bradley,
11 Brisbane bldg.,
Buffalo, N. Y.
Bell 'Phone, Seneca 1232.

BOILERS FOR SALE

SCOTCH BOILER, 7' x 9', 65 H. P., good condition. Also Cluff & Witt marine engine, fore and aft compound, 11¼ x 21¼, 14" stroke, about 60 H. P., complete with pumps. Address W. A. Creech, 14 Blackstone Bldg., Cleveland, Ohio.

STEAMERS FOR SALE.

THE LIGHTHOUSE STEAMER Haze, 145 ft. long, 27-ft. beam, 9-ft. draught, 500 tons capacity, 300 horsepower engine and boiler, suitable for passenger or freight business, fully equipped. Steam capstan, donkey boiler. Jacob Ullman, 46 Lloyd street, Buffalo, N. Y.

STEAMER BALCOM FOR SALE—sidewheel, 80 x 30 x 6; tonnage, 48.41 net; solid oak hull; 2 steel boilers 42 x 10; 2 engines 12 x 24, operate separately or coupled; 120 lbs. steam; draught 3½ ft. Also Barges: One car ferry barge 126 x 26 x 8; light draught, 18 inches. One 74 x 24; one 76 x 24; light draught each small scow 14 inches. All in first class condition for service. Address American Lumber Co., Manhattan Bldg., Chicago, Ill.

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TUG FOR SALE, 14 x 16 Engine, 44 ft. 4 in. length, beam, 11 ft. 2 in.; depth, 6 ft. 5 in.; hull and boiler as good as new. Price, $2,500.00. Write F. Alberts & Sons, Muskegon, Mich.

FOR SALE, MISCELLANEOUS.

NEAFIE & LEVY F & A Compound 26"-50" x 30" with Surface Condenser and Pumps. Will alter to 22"-50" x 30" for high steam.

13½ K. W. Electric Lighting Set.

Williamson Steering Engine.

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D. C. Sturtevant Blower & Engine.

Two Scotch Boilers 12' x 12'.

Two Scotch Boilers 11' x 12'.

Two Scotch boilers 13½' x 12'.

MARVIN BRIGGS, INC.,
154 Nassau Street, New York.

IN THE DISTRICT COURT OF THE UNITED STATES FOR THE EASTERN DISTRICT OF MICHIGAN, NORTHERN DIVISION: IN ADMIRALTY.

In the Matter of the
Petition of Frank S. Upton, owner of the steamer John C. Gault, for Limitation of Liability.

The undersigned, Hezekiah M. Gillett, a trustee appoined by this court in the above proceedings under the provisions of the Revised Statutes of the United States respecting limitation of liability, was authorized and empowered by the order of this Court made and entered on June 14, 1907, to cause the said Steamer John C. Gault, her engines, boiler, machinery, boats, tackle, apparel and furniture, to be sold as said property now lies, at public auction.

Now, therefore, by virtue of said order, *notice is hereby given*, that I shall cause to be sold at public auction, to the highest bidder for cash, at the front door of the Post Office Building, so called, on Washington Street in Bay City, Michigan, that being the building in which are held the sessions of the District and Circuit Courts of the United States for the Northern Division of the Eastern District of Michigan, on Saturday, the 6th day of July, 1907, at 2 o'clock in the afternoon of that day, the said Steamer John C. Gault, her engines, boiler, machinery, boats, tackle, apparel and furniture as said property now lies.

Dated, Bay City, Michigan, June 17th, 1907.

HEZEKIAH M. GILLETT, *Trustee*,
Bay City, Mich.

Shaw, Warren, Cady & Oakes, Detroit, Mich.
Proctors for petitioner.

Gray & Gray, Detroit, Mich.
Proctors for libelants in principal case.

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